THE LANCET.

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CONTENTS.

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THE BRADSHAW LECTURE on Cancer. Delivered at the Royal College of Surgeons of England on Wednesday, Dec. 7th, 1910, by Sir ALFRED PEARCE GOULD, K. C. V. O., M. S. Lond., F.R.C.S. Eng., Senior Surgeon to the Middlesex Hospital.—(*Illustrated*) 1665

THE BRADSHAW LECTURE on the Results of Bronchial Obstruction. Delivered before the Royal College of Physicians of London on Nov. 1st, 1910, by G. NEWTON PITT, M.D.Cantab., F.R.C.P. Lond., Physician to Guy's Hospital and Lecturer on Medicine.—(*Illustrated*) 1674

ORIGINAL ARTICLES.

The Theory and Practice of the Treatment of Syphilis with Ehrlich's New Specific "606." By JAMES MCINTOSH, Grocers' Research Scholar; and PAUL FILDES. (From the Bacteriological Laboratory, London Hospital—Dr. W. BULLOCH) 1684

A Pedigree Showing Bi-Parental Inheritance of Webbed Toes. By H. P. NEWSHOLME, M.B.Oxon., M.R.C.P. Lond., B.Sc.Lond. 1690

Note on an Obscure Case of Peritonitis. By R. H. NORMAN, M.D. Lond. 1691

Uterine Cervical Polypus Undergoing Malignant Degeneration. By H. MACNAUGHTON-JONES, M.D., M. Ch., M. A. O. Q. U. I., F.R.C.S. Irel. & Edin., President of the Obstetrical and Gynæcological Section of the Royal Society of Medicine. (*Illustrated*) 1691

CLINICAL NOTES:

MEDICAL, SURGICAL, OBSTETRICAL AND THERAPEUTICAL.

Note on CO Poisoning at the Whitehaven Pit Disaster. By C. J. J. HARRIS, M.D. Durh., and EUSTACE THORP, L.R.C.S. Edin. 1693

Note on a Case of Loss of Vision Following a Small Dose of Santonin. By E. J. BAXTER, L.R.C.P. & S. E. 1693

MEDICAL SOCIETIES.

ROYAL SOCIETY OF MEDICINE: SURGICAL SECTION:—Fractures near Joints 1694

SECTION FOR STUDY OF DISEASE IN CHILDREN:—Congenital Obliteration of Bile-ducts with Hepatic Cirrhosis 1695

MEDICAL SOCIETY OF LONDON: Heart Strain and Dilatation 1696

ROYAL ACADEMY OF MEDICINE IN IRELAND: Transperitoneal Cystotomy, with Report of a Case.—X Rays in the Diagnosis of Urinary Calculi 1698

EDINBURGH MEDICO-CHIRURGICAL SOCIETY: Discussion on Blood Pressure 1699

SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY: Exhibition of Cases.—Double Frontal Sinus Disease.—Purulent Labyrinthitis 1700

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY: Exhibition of Cases 1701

LEEDS & WEST RIDING MEDICO-CHIRURGICAL SOCIETY: Nodular Fibro-myositis.—Exhibition of Specimens ... 1702

HARVEIAN SOCIETY: Fevers from the Standpoint of the Clinician 1703

LIVERPOOL MEDICAL INSTITUTION: Incipient Glaucoma, its Diagnosis and Treatment 1703

MANCHESTER DERMATOLOGICAL SOCIETY: Exhibition of Cases 1703

REVIEWS AND NOTICES OF BOOKS.

Die Wassermannsche Reaktion, mit besonderer Berücksichtigung ihrer klinischen Verwertbarkeit. (Wassermann's Reaction, with Special Consideration of its Clinical Application.) Von Priv.-Doz. Dr. Harald Boas 1704

Spondylo-therapy: Spinal Concussion and the Application of Other Methods to the Spine in the Treatment of Disease. By Albert Abrams, A.M., M.D. Heidelberg. 1705

American Practice of Surgery: A Complete System of the Science and Art of Surgery by Representative Surgeons of the United States and Canada. Edited by Joseph D. Bryant, M.D., LL.D., and Albert H. Buck, M.D.... 1705

Technical Mycology: The Utilisation of Micro-organisms in the Arts and Manufactures. By Dr. Franz Lafar. Translated by Charles T. C. Salter 1706

Allen's Commercial Organic Analysis. Edited by W. A. Davis, B.Sc., A.C.G.I., and Samuel S. Sadtler, S.B. 1706

Bier's Hyperemic Treatment in Surgery, Medicine, and the Specialties: a Manual of its Practical Application. By Willy Meyer and Professor Dr. Victor Schmeiden. Second Edition 1707

Manuel de Neurologie Oculaire. Par F. de Lapersonne et A. Cantonnet..... 1707

A Prescriber's Companion. By Thomas D. Savill, M.D. Lond. Fourth Edition. Revised by the author, assisted by Charles F. Harford, M.A., M.D. Cantab. 1707

The Science of Happiness. By Henry Smith Williams, M.D., LL.D. 1707

Science German Course. By E. W. Paget Moffatt, M.A. Lond., M.B., B.C. Camb. Second Edition 1708

Fly-leaves from a Fisherman's Diary. By Captain G. E. Sharp 1708

NEW INVENTIONS.

The "Autofume."—(*Illustrated*)..... 1708

Wechselmann's Apparatus for the Injection of "606" 1708

LEADING ARTICLES.

PELLAGRA INVESTIGATION 1709

CRANIO-CLEIDO-DYSOSTOSIS ... 1710

RECENT STUDIES IN EPIDEMIC POLIOMYELITIS 1711

ANNOTATIONS.

The Medical Faculty of the University of London 1713

The Stethoscope..... 1713

The Use of Hydrocyanic Acid Gas for Killing Rats and Rat Fleas 1713

Spontaneous Dislocation of the Hip Following Acute Infectious Diseases 1714

The Meat-supply at Smithfield Market 1714

Pharyngeal Pituitary Body ... 1715

The Toxic Effects of Ascarides 1715

Early Operations for Cataract in France 1715

The Treatment of Ulcers of the Leg by a Paste of Gelatin, Glycerine, and Zinc Oxide 1716

Cholera in Madeira 1716

VITAL STATISTICS:

Health of English Towns ... 1719

Health of Scotch Towns..... 1720

Health of Irish Towns 1720

SPECIAL ARTICLES.

The London County Council and the Royal Commission on the Feeble-minded 1717

Medicine and the Law: A Medical Man's Experience of the Workmen's Compensation Act..... 1718

The Services: Osborne: Report of the House Governor and Medical Superintendent 1720

The New Wing of the University of Bristol.—(*Illustrated*) 1726

Manchester: Value of Light; Plague Precaution; The Manchester Hospital for Incurables 1728

Wales and Western Counties: The Medical Treatment of School Children 1728

Scotland: The Voluntary Health Visitors of the City of Edinburgh 1729

Ireland: Congress of the Royal Institute of Public Health; Royal Medical Benevolent Fund..... 1730

Paris: Action for Damages against a Surgeon 1731

Berlin: Unqualified Practice.. 1732

Canada: Mortality from Consumption Decreasing in Montreal 1733

Notes from India: Sanitation in Eastern Bengal and Assam..... 1734

CORRESPONDENCE.

The General Medical Council and the Proposed Anæsthetics Act (Dr. Frederic Hewitt) 1722

Thrombotic Softening of the Spinal Cord as a Cause of So-called "Acute Myelitis" (Dr. H. Charlton Bastian, and Dr. E. Farquhar Buzzard) 1723

The Motor Functions of the Stomach (Dr. Arthur F. Hertz)..... 1724

The Ownership of Medical Prescriptions (Dr. F. Lucas Benham)..... 1724

Polydactylism and Heredity (Dr. A. Banks Raffle)..... 1725

Invalidity Insurance (Mr. W. A. Robertson) 1725

A Correction (Mr. H. Llewellyn Heath) 1725

OBITUARY.

Thomas Nadauld Brushfield, M.D. St. And., M. R. C. S. Eng., F.S.A..... 1735

Edward Henry Brien, M.D. Dub. 1735

Deaths of Eminent Foreign Medical Men 1736

MEDICAL NEWS.

Congress in Berlin 1673

Foreign University Intelligence 1673

Medical Journalists' Congress 1673

Royal College of Physicians of London 1684

New Chemical Laboratories at University College, London 1689

Food Congress..... 1689

Colonial Medical Service: West African Medical Staff 1703

Death of Dr. Augustus Henry Bampton 1716

Metropolitan Hospital Sunday Fund 1725

Pass-list of the University of Oxford 1736

University of Bristol: the late Dr. Long Fox 1736

Royal Institution 1736

A Gloucestershire Centenarian 1736

The Late Dr. Arthur Foxwell..... 1736

Metropolitan Water Board: Appointment of District Medical Officers 1737

Presentation to Mr. Charles J. Bond 1737

Books, &c., received 1737

Appointments..... 1738

Vacancies 1738

Births, Marriages, and Deaths.. 1738

Notes, Short Comments, and Answers to Correspondents.. 1739

Medical Diary 1740

Meteorological Readings..... 1741

Acknowledgments of Communications received 1742

FOR INDEX TO ADVERTISEMENTS SEE PAGES 2 & 4.

INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

COVER

PAGE

BAILLIERE, TINDALL & COX:—
Aarons..... Gynæcological Therapeutics 1
Bidwell .... Intestinal Surgery 1
Gray ..... Ear and its Diseases.... 1
Jennings .... The Morphia Habit 1
Rose & Carless.... Surgery 1
Turner ..... Radium 1

CELTIC PRESS:—
White ..... Infected Ears 1

CHURCHILL, J. & A.:—
Bigg ..... Spinal Curvatures..... 1
Warden .... Paris Medical School .. 1

GLAISHER:—
Herschell .. Indigestion 1
Savill ..... Neurasthenia 1
" ..... Lectures on Hysteria .. 1

LONGMANS, GREEN & CO.:—
Wright ..... Vaccine Therapy 1

MURRAY:—
Ross ..... Prevention of Malaria 1
" ..... Philosophies 1

SAUNDERS COMPANY:—
Fenwick .... Dyspepsia!..... 1
Tousey ..... Medical Electricity, &c. 1

PAGE

MEDICAL LIBRARIES, &c.:—
Lewis's Circulating Library 1
Norwood Sanatorium—
Hare: Inebriety 1

ARNOLD:—
Calwell .... Medical Treatment 5
Further Advances in Physiology 5
Greenwood.. Physiology of the Special Senses 5
Henderson .. Glaucoma 5
Parker ..... Diseases of the Nose, &c. 5
Practical Physiology 5
Recent Advances in Physiology and Bio-Chemistry 5
Savill ..... Clinical Medicine 5
Stewart .... Nervous Diseases 5
Walker .... Hereditary Characters.. 5
Walton .... Fractures and Separated Epiphyses 5

CASSELL & CO.:—
Herman .... Diseases of Women 6

CHURCHILL, J. & A.—
Cripps ..... Ovariotomy, &c. 8
Thorne, Bezly .... Schott Nauheim Treatment, &c., of the Heart 8

FROWDE AND HODDER & STOUGHTON:—
Horder ..... Clinical Pathology in Practice 7

PAGE

FROWDE—(Continued)
Kirmisson .. Surgery of Children 7
Thomson & Miles..... Manual of Surgery 7
Woodhead .. Practical Pathology 7

GRIFFIN & CO.:—
West ..... Diseases of the Organs of Respiration 6

LEWIS:—
Lewers..... Diseases of Women 8
" ..... Cancer of the Uterus .. 8

LONGMANS, GREEN & CO.:—
Bennett, Sir W. .... Massage & Movements in Recent Fractures .. 8

MACMILLAN & CO.:—
Ballance .... Surgery of the Brain .. 6

METHUEN & CO.:—
Cavanagh .. The Care of the Body .. 8
Childe ..... Control of a Scourge .. 8
Clouston .... The Hygiene of Mind .. 8
Drink Problem 8
Gore, Sir J. E. Children of the Nation 8
Macfie ..... Air and Health 8
Newman .... Infant Mortality 8
Newsholme.. Prevention of Tuberculosis 8
Oliver, Sir T. Diseases of Occupation 8
Sainsbury .. Drugs, &c. 8
Schofield .... Functional Nerve Diseases 8

PAGE

MURRAY:—
Gaucher .... Diseases of the Skin.... 6

NISBET & CO.:—
Bennett, Sir Wm. ..... Injuries, &c., of the Knee-Joint 6

SAUNDERS COMPANY:—
Cullen ..... Adenomyoma of Uterus 3
Deaderick .. Malaria 3
Friedenwald & Ruhrah.. Dietetics 3
Gant ..... Constipation, &c. 3
Kelly & Cullen .... Myomata of Uterus 3
Robson & Cammidge On the Pancreas 3
Tousey ..... Medical Electricity, &c. 3

THE LANCET:—
Territorial Medical Service 6

MEDICAL LIBRARIES, &c.:—
Baker—Book Bargains..... 10
Boas cy & Ketley—Stammering 8
Behnke—Stammering 10
Lewis—
Lewis's Circulating Library 9
Martindale & Westcott: 606 9
Loxton—
Australian Medical Directory 6
Matthews Bros.—
Wood: Application of Trusses.... 8
Schnelle—Stammering 8

OFFICIAL AND GENERAL ANNOUNCEMENTS

COVER

OFFICIAL NOTICES:—
Royal Society of Medicine..... 1

APPOINTMENTS VACANT:—
Bedford County Hospital..... 68
Bradford Union 69
Cardiff Infirmary 70
Chelsea Hospital for Women..... 69
City of London Hospital for Diseases of the Chest 68
Dental Hospital of Manchester..... 69
Derbyshire Royal Infirmary 70
Free Eye Hospital, Southampton 70
Glasgow Parish Council 70
Hastings, St. Leonard's, &c. Hospital.. 68
Highlands and Islands of Scotland.... 70
Hospital for Consumption, Liverpool.. 69
Indian Medical Service 69
Kent and Canterbury Hospital..... 68
Leeds General Infirmary..... 68
Leicester Infirmary 68
Lincoln General Dispensary 68
Middlesex Hospital 69
National Dental Hospital and College, Great Portland-street 68
Norfolk and Norwich Hospital..... 69
North Devon Infirmary, Barnstaple .. 70
Parish of Bermondsey 69
Park Hospital for Children 68
Queen's Hospital for Children 69
Rotherham Hospital 69
Royal Hants and Southampton Hosp.. 68
Royal Hosp. for Diseases of the Chest, City-road 69
Royal Victoria Hosp., Bournemouth.. 69
St. Bartholomew's Hosp. and College. 69
St. Luke's Hosp. for Mental Diseases.. 68
St. Mark's Hospital for Cancer..... 69
St. Thomas's Hospital 69
School of Medicine, Cairo 68
Sheffield Royal Hospital 68
South Uist, Southern Division 70
Staffordshire General Infirmary 68
Sussex County Hospital, Brighton .. 68
Victoria Hospital for Children, Chelsea 70
Wandsworth Union Infirmary 69
West London Hospital..... 69
Weston-super-Mare Hospital..... 69

ASSISTANCIES, MEDICAL:—
Cameron, Cambridge..... 76
Hill, Old Basford..... 75
No. 701, L.O., Strand..... 75
No. 702, L.O., Strand..... 75
No. 704, L.O., Strand..... 75
No. 706, L.O., Strand..... 75
No. 709, L.O., Strand..... 75
School Registrar, St. Bartholomew's Hospital 75
Secretary, Southampton-street 75
Scholastic, Clerical, &c., Association 75
Turner, Adelphi 76
W. E. R., Forest Hill 76

ASYLUMS, HOMES, &c.:—
Ashwood House, Kingswinford 61
Barham, Worthing 67

ASYLUMS—(Continued).
Barnsley Hall, Bromsgrove 62
Barnwood House Hospital 62
Bishopstone House, Bedford 61
Brooke House, Upper Clapton 67
Buntingford House Retreat, Buntingford 65
Camberwell House, Peckham-road..... 61
Cheadle Royal 61
Clarence Lodge, Clapham-park..... 61
Coppice, The, Nottingham 62
Crookbarry Sanatorium, Surrey 66
Croydon Mental Hospital 62
Dalrymple House, Rickmansworth..... 60
Dartmoor Sanatorium 66
David Lewis Colony, Alderley Edge .. 67
Dinsdale Park, Darlington 67
Earlswood Asylum, Redhill 63
Fairford Retreat, Gloucestershire 67
Ghyllwoods..... 64
Goffe, Miss, Finchley..... 67
Grove House, Church Stretton 62
Grove, The, Catton, Norwich 62
Gwydor Nursing Home 67
Haslemere Nursing Home 67
Haydock Lodge, Newton-le-Willows.. 63
Hazelwood, Grange-over-Sands 67
Heigham Hall, Norwich 62
Home for Epileptics, Maghull 67
Home Sanatorium, West Southbourne 66
Hon. Sec., Chancery-lane 67
Inverercden Sanatorium, Dalrieh 64
Invernith Lodge Retreat, Colinsburgh 64
Kingsdown House, Box 61
Lady Superintendent, Streatham..... 67
London Fever Hospital, Islington..... 61
London Open-Air Sanatorium, Wokingham 65
Malling Place, Kent 62
Melbourne House, Leicester 60
Mendip Hills Sanatorium 66
Middleton Hall, Co. Durham..... 61
Moat House, Tamworth 62
M. W. R., Rugby..... 67
Mrs. B., Cannes 68
Newlands House, Tooting 61
Newmains Retreat, Lanarkshire 64
Nordrach-on-Dee, Banchory 66
Nordrach-upon-Mendip Sanatorium .. 65
Northlands Retreat, Wandsworth 60
Northumberland House, Finsbury-pk.. 63
Northwoods House, Winterbourne.... 63
Norwood Sanatorium 64
No. 538, L.O., Strand..... 67
No. 578, L.O., Strand..... 67
No. 675, L.O., Strand..... 68
No. 682, L.O., Strand..... 68
No. 708, L.O., Strand..... 68
No. 712, L.O., Strand..... 78
Osea Island, Heybridge..... 60
Otto House, West Kensington 61
Peckham House 63
Plas yn-Dinas, Merioneethshire 64
Plympton House, South Devon 62
Portsmouth Corporation Mental Hos.. 62
Roberts, Golder's Green 67
Rueabry Sanatorium, Northallerton.. 60
St. Andrew's Hospital, Northampton.. 62
St. Luke's Hospital, E.C..... 61
Sanatorium Clavadel..... 64
Shaftesbury House, Formby-by-the-Sea 63
Springfield House Private Asylum, Bedford 69
Stocker, Craven-street 67

ASYLUMS—(Continued).
Stretton House, Church Stretton..... 62
The Grange, Rotherham 65
Vale of Clwyd Sanatorium 65
Warneford Asylum, Oxford 61
Wilberforce, Torquay 67
Wye House, Buxton 62
Yarrow Convalescent Home, Broadstairs..... 63

FINANCIAL, &c.—
Birkbeck Bank..... 59
Equitable Reversionary Interest Soc.. 59

HEALTH RESORTS, BATHS, &c.:—
Aberystwyth, the Biarritz of Wales .. 60
Alexandra Therapeutic Institute 67
Bex-les-Bains..... 66
Leysin, Switzerland 66
Peebles Hotel Hydropathic 67
Smedley's, Matlock 67
Wiesbaden 66

HOMES WANTED:—
No. 707, L.O., Strand..... 68

HOTELS:—
Tunbridge Wells—
The Wellington Hotel..... 66
White Hart Hotel, Margate 66

HOUSE & ESTATE AGENTS:—
Baker, Holford & Sons, Nottingham.. 74
Farmer & Sons, Kilburn 74
Guild & Shepherd, Edinburgh 74
Humphreys-Jones, Handsworth 74
Ley Clark Wimpole-street 74
May & Philpot, Brixton-hill 74

LIFE & FIRE ASSURANCIES:—
Prudential..... 59

MASSAGE:—
London School of Massage, &c. 59

MEDICAL ACCOUNTANTS, &c.:—
Turner 75

MEDICAL AGENTS:—
Blundell & Rigby 74
Fieldhall, Limited 71
Manchester Medical Agency 74
Manchester Medical Association 74
Medical Agency 71
Moore & Co. 70
Needes, Herbert 71
Needes, J. C. 70
Peacock & Hadley 74
Reynolds & Branson 74
Scholastic, Clerical, &c., Assoc. 72
Turner 73
Whyte & Co. 75

MEDICAL SCHOOLS:—
(Lowgow.)
West London Post-Graduate College 53

NURSING INSTITUTES:—
General Nursing Association..... 60
Hospital for Sick Children, Great Ormond-street 59
Leeds Trained Nurses' Institution 60
London Nurses' Association 60
Male Nurses' Co-operation 59
Mental Nurses' Co-operation..... 60
Metropolitan Temperance Association 59
National Hos. Male Nurses' Assoc. .. 60
Nurses' Co-operation, Portland-place.. 60
St. Bartholomew's Hos. Nurses' Inst.. 59
St. John's House 60
St. Luke's Hospital, E.C..... 60
Temperance Male and Female Nurses' Co-operation 59
Temperance Male Nurses' Co-operation 58
The Retreat, York 60

OFFICIAL NOTICES:—
City of London Lying in Hospital 76
London Post-Graduate Association .. 57
London School of Clinical Medicine .. 57
Hospital for Sick Children, Great Ormond-street 58
Medical Graduates' College, &c. 57
Queen Charlotte's Lying-in Hospital.. 57
Parliamentary Electors of Edinburgh.. 58
Royal Institute of Public Health 58
Royal London Ophthalmic Hospital .. 58
Society for Relief of Widows, &c., of Medical Men 58
Throat Hospital, Golden-square 57
University of Cambridge..... 57
Western Ophthalmic Hospital 57
York-road General Lying-in Hospital, Lambeth 57

PARTNERSHIPS & PRACTICES:—
J. & L. Clark, Smethwick 75
Forbes, Robertson, & Lillie, Glasgow.. 75
157, Leeds 75
Manchester Clerical, &c., Association 75
No. 672, L.O., Strand..... 75
No. 678, L.O., Strand..... 75
No. 679, L.O., Strand..... 75
No. 689, L.O., Strand..... 74
No. 700, L.O., Strand..... 75
No. 705, L.O., Strand..... 74
No. 705, L.O., Strand..... 75
No. 711, L.O., Strand..... 75
No. 713, L.O., Strand..... 75
No. 714, L.O., Strand..... 75
Owners, Walham Green 75
Peacock & Hadley, Craven-street 74
Stocker, Craven-street 75
Turner, Adelphi 75
Whyte & Co. 74
Winter, South Molton-street 75

RAILWAY & STEAMSHIP CO.'S:—
New Zealand Shipping Co..... 59

TUTORS & LECTURERS:—
Gemmell 59
Knight 58
Needes 71
No. 402, L.O. .. 59
Pennington's Med. Classes 53
Weymouth.. 57, 73

For Index to Trade and Miscellaneous Advertisements see page 4.

The Bradshaw Lecture

ON

CANCER.

Delivered at the Royal College of Surgeons of England on Wednesday, Dec. 7th, 1910,

BY SIR ALFRED PEARCE GOULD, K.C.V.O., M.S. LOND., F.R.C.S. ENG.,

SENIOR SURGEON TO THE MIDDLESEX HOSPITAL.

MR. PRESIDENT AND GENTLEMEN,—In 1884 the late Sir William Savory chose as the subject of the third Bradshaw lecture the Pathology of Cancer. He pronounced the cancer cell to be an "embryonic" or "rudimentary" form of cell, possessing great powers of multiplication and of endurance, but differing from true embryonic cells in its lack of power of differentiation. And then he used these remarkable words:—

> And while tumours of the most innocent type touch, and indeed pass into, natural structures, the most malignant touch, if they do not actually pass into, the class of parasites. ..... The interval between the worst kind of cancer and a parasite must be a very narrow one.

He suggested that the experiments on cancer grafting had probably failed owing to the "crude conditions under which they have been performed." He concluded thus:—

> Before we shall ever be able to answer the question, Why or how do tumours form? it seems to me we must be able to solve the problem of normal growth and development, and to answer the question why or how it is that these continue up to a certain point and then suddenly cease.

For the succeeding 19 years the Bradshaw Lecturers dealt with other subjects, but in 1903 Sir Henry Morris gave a learned review of the many theories that had been advanced to explain the origin and nature of cancer, and specially discussed two theories: the microbic or parasitic theory, which he held to be "non-proven," and Cohnheim's theory of "cancer matrices," ante-natal and post-natal. This theory he strongly supported as explaining all the facts of the disease then known, and he confidently foretold for it a speedy acceptance by all pathologists.

Two years later, in 1905, you, Mr. President, announced, as the title of your Bradshaw lecture, "Carcinoma is a Parasitic Disease," and stated:—

> That the carcinoma cell is an independent organism, like many a protozoon; that it lives a life which is wholly independent and proper to itself; and that it lives as a parasite in the body of the animal which is affected with carcinoma, deriving its nourishment from the host, and having nothing to pay the host for the sustenance of which it robs him.

You shrank from accepting Hauser's suggestion that the protozoal cells of cancer are derived or descended from the living cells of the host, and asserted rather that "the parasite is introduced into the body from without."

It is needless to say that each of these divergent theories has been discussed from the standpoint of a very wide and accurate knowledge of the subject, and that each in turn has been supported with extraordinary ability and with the enthusiasm of a strong personal belief. For me to attempt another review of the same facts and arguments would be to act the disastrous part of Phaeton, and yet I propose, Sir, to raise once again the great problem of the nature of cancer, not because I can read aright the riddle solved so differently, and with such mutual destructiveness, by my predecessors, but because within the last few years the workers in our cancer laboratories have added so much to our store of knowledge that it seems wise to see how far the new facts support or refute former conclusions. We are like children putting together a dissected picture, we slowly look over and often vainly try to fit together the irregular pieces of the puzzle, but gradually order comes here and there out of chaos, and as piece after piece finds its proper setting the picture grows until the fitting in of the final fragment reveals the whole design.

DEVELOPMENT OF CANCER RESEARCH.

In addition to the influence of the general progress of biological knowledge, two discoveries have caused a great development in cancer research: the proof that cancer can be transferred from animal to animal, and the demonstration of the influence of radio-active bodies upon cell growth. Scientific workers have devoted themselves to the solution of the problem of cancer with new courage and more confident hope since they saw that it could be submitted to that experimental method which has so often dissipated the darkness of ignorance. All over the civilised world cancer research laboratories, more or less exclusively devoted to this quest, have been founded, and never before have the efforts of scientific men been so largely centred in the study of any one disease. Highly gifted investigators are devoting themselves with praiseworthy devotion to the study of the internal structure and arrangement of cancer cells, to a search for the forms and evidences of the presence of an invading organism, to a close scrutiny of all that takes place in the artificial transmission of the disease from animal to animal, and to the investigation of the various abstruse problems in bio-chemistry and physics that it is hoped may aid in the discovery of the nature and cause of cancer. This College, in conjunction with our sister in Pall Mall, by the initiation, control, and housing of the Imperial Cancer Fund, has taken a very prominent part in this movement, and it is a matter of great satisfaction that the researches carried out in our laboratory are universally recognised as having been of fundamental importance. We gladly recognise that all the success which has attended, and may hereafter attend, the labours of Dr. Bashford and his distinguished associates is not due to the association with these Royal Colleges, nor to the sources from which the fund has been collected, but to the ability, the wide knowledge, the patience, and the honesty that are associated with the laborious industry of the workers. It is not my purpose to give a detailed account of the latest results of cancer research, but rather briefly to enumerate some of them, and to see whether and how far they enable us to unravel what has hitherto been a tangled skein.

INCIDENCE OF CANCER IN MAN AND ANIMALS.

It is now known that *cancer occurs in all races of men.* Wherever adequate investigations have been made cancer has been found, and the fuller our knowledge of any people the ampler is the evidence of the presence of cancer among them. We are unable, therefore, to attribute the disease directly to the influence of race, of climate, of diet, of occupation, of soil, of the subtler accidents of civilisation, or to any of the associated and complex conditions that may be summarised as "environment." Not that these factors are without influence. Certain occupations are assuredly attended with peculiar liability to cancer; I need only mention chimney sweepers and workers in X rays, tar, and paraffin; and the beneficent effect of circumcision in greatly diminishing the incidence of epithelioma of the penis, and the pernicious influence of the use of the kangri, show us how the disease may be affected by social customs. It is clear, however, that we may not regard any of these conditions as the essential cause of cancer, for the disease occurs in their absence, and we must carefully guard against confusing subsidiary, accelerating, predisposing factors with the inevitable, constant cause of the disease.

Human statistics cannot be relied upon to substantiate or define the influence of race. Dr. Bashford has been at great pains to point out the imperfect character of all statistics of cancer incidence, and he has clearly shown that the proportion of cancer reported among different nationalities is at present only a measure of the value of the material submitted to examination, and must not be taken as a true picture of the actual frequency of cancer. Only as care in diagnosis, in pathological examination, and in records improves and becomes uniform in all races of men, shall we be able to state with precision what influence race, among many other factors, has upon the incidence of cancer. The experimental study of cancer has, however, shown that we must not assume that all races of men are equally liable to cancer. Very early in the investigations into the inoculability of mouse cancer

it was realised that there were serious discrepancies in the results obtained by different expert workers. Some of these discrepancies were caused by differences of technique, others by inattention to the age of the mice used for the experiments, and others again to the particular tumour experimented with. Chiefly owing to the work of Dr. Bashford these causes of variation in the results obtained have been recognised and eliminated, and the influence of race has thereby been demonstrated. Such facts as these have come to light. Haaland found that a certain tumour grew on inoculation in nearly 100 per cent. of Berlin mice, in 24 per cent. only of Hamburg mice, and failed altogether to grow in Christiania mice. Loeb has a sarcoma which was readily propagated in white rats, and could not be inoculated into coloured rats. Tyzzer has a carcinoma found in a Japanese waltzing mouse, which he can transplant successfully in practically 100 per cent. of this particular family of mice, but which altogether fails to grow when inoculated into common mice. On the other hand, Jensen's tumour, which grows readily in common mice, cannot be inoculated with success into the Japanese waltzing mice. In hybrids resulting from the crossing of common white mice and Japanese waltzing mice, the Japanese tumour grows as uniformly and even more rapidly than in the pure Japanese mice, but in the second and third generations of the offspring of these hybrids the Japanese tumour cannot be inoculated at all. In his earliest inoculations of Jensen's tumour, Bashford found it impossible to succeed with blue mice, while he obtained 25 per cent. of success with other tame mice. He also relates that a tumour sent to him by Dr. Michaelis of Berlin was transplanted into 19 Berlin mice, with the result that nine tumours grew, but only one small tumour developed in 182 tame London mice similarly inoculated. It is, of course, most important to keep clearly before one's mind the difference between the liability to occurrence of sporadic cancer in an individual or animal, and the susceptibility of such an individual or animal to the successful inoculation with cancer transferred from another. Such facts as I have just mentioned, however, make it imperative upon us, while recognising the presence of cancer throughout the human race, to keep a mind open to receive a demonstration, should it come, of the influence of race upon the incidence of cancer, apart from all accidental and accessory conditions.

Passing now from this first fact—that cancer is a disease of man wherever and however he lives—I would next remind you that we have recently learnt that *cancer is a disease that occurs in all vertebrate animals.* It is not limited to man, nor even to man and primates, nor even to the great family of the mammalia; it has been proved to occur in birds, reptiles, and fishes. The disease, as met with in the lower vertebrates, is not a similar disease, but veritable cancer, with the same histological characteristics and with those special biological features that we find in man—the uninterrupted growth, the power of infiltration, and the formation of metastases. The importance of this demonstration is enormous. It dissipates at once all those theories which would find the cause of cancer in any condition peculiar to man; we have to seek it in some influence which man shares with all other vertebrates. When we reflect that there is no known instance of an external infective agent or organism which spontaneously attacks and produces its characteristic pathological effects in all vertebrata, or in all the varying physical conditions of environment in which cancer is found, the parasitic theory of cancer fails even to be a satisfactory "working hypothesis." We can only adopt it, if the fact is demonstrated and Koch's conditions of proof are fulfilled; and such a demonstration is certainly not forthcoming.

That cancer can be transferred from host to host is now attested by thousands of successful experiments upon mice, rats, and dogs. Four facts have come to light during these inoculation experiments which are important to bear in mind. In the first place, the successful grafting of cancer from animal to animal is far more difficult to accomplish than is the inoculation of microbic disease. In the second place, it has been found that it is always difficult to succeed in the primary grafting experiments of a sporadic mouse tumour into another mouse, or in the first graftings of a tumour upon a fresh family of mice. In the third place, as I have already mentioned, it has been found that when allowance has been made for these variations the success of grafting experiments may vary considerably in different races or families of mice. And then towering above these lesser facts is the greater, all-important one, that *cancer cannot be transferred to an animal of another species.* Cancer of a mouse is readily transferred to other mice, but it cannot be grafted upon a rat, or upon any other animal of another species. The same holds true of cancer of the rat and dog, and in this specificity of cancer we see the cause of failure of all experiments to graft the human disease upon lower animals. These failures were not due, as Savory suggested, to the "crude methods" employed, but to the working of a biological law.

The fact that an inoculable disease is specific in the sense that it cannot be transferred from species to species surely must be one of great importance in any consideration of its nature, for the grouping of animals into species is not artificial. The differences that we recognise between species have a greater element of permanence than those between varieties; the offspring of crossed varieties are fertile, while the hybrids of crossed species are almost invariably infertile; the number of chromosomes in somatic cells differs widely, but it is constant for every species. Difficult, therefore, as it may be to express the distinguishing limitations of a species in terms which will satisfy the exacting criticisms of modern schools of biologists, all agree that the word connotes a reality, that it indicates an important step in the path of evolution, and that the limits between species are true landmarks. The enormously wide range of the incidence of cancer, the uniformity of its biological characters, and its specific inoculability are a triad of facts unique in pathology and of tremendous significance. Apart from many minor considerations, I venture to submit that they are inconsistent with what we know of infective or parasitic diseases. They, too, are no doubt "specific," but the specificity is attached to the disease, and neither to the animal nor to the tissue in which it occurs. The tubercle bacillus leads to the same disease in the guinea-pig as in the man from whom the virus may have been taken. The minute anatomy of tubercle is the same in whatever part or tissue of the body it arises; it does not vary with its primary site, as is constantly the case in cancer. Cancer is distinguished from all infective and parasitic diseases by the fact that the cellular parentage of a malignant growth is always definitely marked, and that whether it originates in squamous, columnar, or spheroidal epithelium, in endothelium, or in any of the forms of connective tissue cells, it retains throughout its whole life, and wherever found, characteristic features of its parent cell. Parasitic diseases are anatomically and etiologically specific—specific in their structure and cause; cancer is specific not in structure, perhaps not in cause, but in the physiological character of its cells.

THE CANCER CELL.

The essential part of every cancerous growth is the living cancer cell! The cell, whether of carcinoma or sarcoma, is the one essential part, that which contains within itself all the potentialities of the whole of cancer. While it lives as a cell, the cancer is living, when it dies as a cell, it is impossible to find or develop or excite any of the parts, or agencies, or faculties of a cancer. By no one has the demonstration of this fact been carried so far, or made so indubitable, as by Bashford and his fellow-workers in our laboratories. Their investigations into what takes place in the "early stages" of successful transference of a cancer from mouse to mouse have revealed, that in the tiniest practicable graft, all the introduced stroma, and many of the centrally placed cancer cells die, but that the cells, or some of them, in the periphery of the graft live, do not undergo degenerative changes, and after a few days—usually about four—excite the formation from the fibroblasts of the host, of a new supporting and vascular stroma, and themselves show the changes indicative of cell division. The parenchyma of the tumour, which ultimately may grow to a huge size, all develops directly from those cancer cells of the graft which were able to withstand the hurtful influences of the process of grafting. While it is possible to transfer cancer from mouse to mouse so long as care is taken to introduce living cancer cells in the graft, it is impossible to do this when the cancer cells are destroyed by pounding in a mortar, or their vitality has been injured, as by the influence of heat. Indeed, Schwann's

great doctrine of "*omnis cellulae cellula*" is peculiarly true of cancer.

On the other hand, it has been equally clearly shown of inoculated infective granulomata that they grow not from the graft but from the connective tissue of the host. This difference between cancer and infective granulomata is of fundamental importance, a veritable *differentia*. The metastases of cancer and of granulomata may be alike in some of their coarser anatomical features, such as their site, but in their nature, in their true biological characters, they are absolutely distinct, with a distinction which is vital and fundamental. If the living cancer cell is the essential part of cancer it is important to know what are its anatomical and physiological characteristics. A study of them demonstrates that the cancer cell is only a variation of a normal cell—it possesses neither in structure nor in powers anything not found in the healthy cell. Let me rapidly mention the established facts about living cancer cells.

First, *they possess a great power of continuous multiplication*. So far as the experiments with Jensen's tumour have gone it seems that the grafting can be carried out with it as successfully now after seven years as at first and that from the small sporadic tumour in the mamma of a mouse a mass of cancer has been grown through an unknown number of mice, amounting to far more than a thousand times the bulk of the original tumour, or even of the original mouse. Bashford has particularly laid stress upon this striking fact, and has spoken of it as a "new" biological fact, but in that I think he has probably exceeded. Certainly in the protozoa such apparently endless multiplication and growth of living cells can be recognised. And when we cast our minds back to the development of the human ovum—a single cell—and remember that from it directly descends the entire mass of cells which form and maintain through his threescore years and ten the full stature of a man, we see a power of cell growth which we need not shrink from comparing with that of a Jensen's cancer cell. But it is particularly noteworthy that in cancer this power of continuous multiplication is spontaneously manifested most often in the cells of an organism that has passed the period of youth and maturity, and has already entered upon the declining phase of life.

The second characteristic feature of the cancer cell is that *it retains the inherited limitations to type* of the cells among which it first appears. The descendants of an epiblastic cancer cell retain, in the main, the features of their early parent—a hypoblastic cancer cell bears its own family likeness, and the sarcoma cell is always a distinctively mesoblastic cell. Even in those remarkable experiences that have been so carefully studied and admirably recorded by Bashford and Haaland, when they observed in a series of transplantations of an undoubted epiblastic cancer of a mouse its gradual conversion, first into a cancer with a richly cellular stroma, then into a "mixed" tumour, and finally into a sarcoma, it is clear that the mesoblastic cancer (sarcoma) thus formed sprang from the connective tissue cells of the hosts, and that its cells are in no sense or degree the lineal descendants of the original cells of the epiblastic cancerous parenchyma.

Thirdly, *cancer cells develop and differentiate but little and irregularly*. Thus in a squamous epithelioma there is great variation in the extent to which keratinisation of the cells occurs, and in some cancers we see such departures from type as a change from squamous to columnar cells and from spheroidal to columnar cells, or *vice versâ*; the differentiation of a mammary cancer may be into acinous or glandular carcinoma or into a combination of the two. This variation in growth has been best observed in the experimental work in laboratories, where the opportunities of studying the same strain of tumour in many succeeding stages of its growth and through many hosts afford scope for observation such as can never be found in human pathology.

The development of the cancer cell is neither purposeful nor effective. In glandular carcinoma no regular grouping of acini around primary ductlets is found, nor does the cell metabolism issue in useful secretion. In a squamous carcinoma no impermeable protective covering is formed, and in a sarcoma no useful fibrous bands or aponeuroses, no attached and functional muscles, no perfectly constructed and useful bone is formed. In cancer there is cell multiplication in exaggerated degree, but a lack of adaptation to the many and varied needs of the organism. The cancer cell shows no new faculty or endowment, no power of "rising on its dead self"; it is a less highly endowed cell than its physiological parent. Then, again, *cancer cells exhibit periodicity in their growth*. Bashford has found that a mouse tumour has its period of active growth succeeded by one of less activity, and that the success of artificial transference of the disease to other mice rises and falls with this wavelike activity of the tumour, and he has found that this periodic activity is transmitted to the tumours which arise from the grafts—that it is an inherent or inherited property. Similar variations in the rate of growth and activity of cancer are also seen in the human subject, and we see periodic activity in metastases—periodic activity in their occurrence as well as in their growth. We must not look upon such variations as due, of necessity, to a change in the resisting forces of the patient; they are probably due to the inherent periodic growth of cancer. Physiological periodicity of cell growth is, of course, well recognised; I need only mention such examples as the sexual periodicity in animals and especially in the human female, the periodic growth of young animals, the periodic growth of hair, and the periodicity in the life-history of salmon, and the periodic variation in the colour of the fur and feathers of many mammals and birds.

The study of the form of cancer cells and the attempt to find in it some index of their nature has yielded but little that is positive. The many determined efforts to see within them foreign living forms, whether of bacteria, of protozoa, or of yeasts, have failed. Bacteria may, of course, intrude within a cancer cell, but it was a cancer cell before the intrusion, and we may assert with some confidence to-day that there is no visible evidence of parasitism in the cancer cell. Nor has the hopeful and brilliant study of the mitoses of cancer by Walker, Moore, and Farmer, and their followers lifted the veil. It seemed that the theory that cancer was a gametoid tissue would explain much, or at any rate establish on a firm footing the nature of the disease. But we must regretfully consent to see that hope unfulfilled, and admit that mitosis is no key to the riddle. Quite recently, however, it has been shown by Beckton that all the cells of man, except the keratin cells of squamous epithelium, the cells lining the conducting tubes of the kidney, the cells of unstriped muscle, and the unimpregnated ovum, contain certain granules, which are known as Altmann's granules. While unrecognisable in the protoplasm of the ovum, these granules are seen in the unincubated blastoderm of the egg, and are readily recognised after six hours' incubation. Beckton has found them in mouse embryos of 8 mm. and 12 mm. in length, and in the rat embryo of 30 mm. They appear, therefore, very early indeed in the descendants of the original single ungranulated cell of the ovum. Beckton states that these particular granules are seen in the cells of the stroma of carcinoma, *but not in the cells of the parenchyma*, and while abundant in the protoplasm of inflammatory and granulomatous tissue they are invariably absent from the cells of sarcoma. Beckton examined also 21 mouse tumours sent him by Dr. Bashford, and in 14 of them there were no granules, but in five instances they were present. They are therefore commoner in mouse tumours than in human malignant growths. Should further observations confirm Dr. Beckton he will not only have given us a very useful method of diagnosis, but he will have established a morphological difference between cancer cells and most normal cells. He will also have afforded an anatomical proof that cancer cells are not embryonic cells.

Of the *intracellular metabolism of the cancer cell* we know but little; it seems to beget no toxin, to generate no new substance, and to depart but little from the chemistry of health. And yet we cannot doubt that its special biological characters are inseparably linked with some intracellular chemical peculiarities. We have evidence of this furnished by some very careful spectroscopical observations made by Mr. Mottram in Dr. Lazarus-Barlow's laboratory, by which he has shown that the potassium content of the red corpuscles of cancerous patients is considerably higher than in health, the difference being represented by the figures 1·5 and 3. The sodium content, on the other hand, shows no change. The importance of this observation is enhanced by the further

fact that while the sodium content of all carcinomatous tumours is about the same, the potassium content of primary cancerous growths is higher than that of secondary, and the potassium content of squamous-celled tumours is higher than that of spheroidal celled. Mottram has, therefore, shown that the cancer cell has a chemical coefficient, but it is a modification in degree, and not in kind, of that of the healthy cell. These are the facts at present known about cancer cells as independent entities. We must now look at them as members of a community, and study their relations to neighbouring cells.

First we must notice *the disproportionate growth of the cancer cell.* It bears no relation to the growth, the needs, or the condition of the neighbouring cells and tissues, and, as it often tends to outgrow its stroma, and, by the pressure of its cells, to compress the capillaries, we have in this fact an explanation of the frequent degeneration, fatty and otherwise, of the cancer cells. The hæmorrhage which so frequently occurs in some cancerous growths may also be in part due to the same fact. The disproportionate growth of the cancer cell has been mistaken for evidence of its being an independent organism, but we shall see abundant reason for rejecting this view and for being certain that a cancer cell is an altered body cell.

The pressure caused by the incessant and disproportionate *multiplication of the cancer cells causes not only complicated infoldings of the cancer itself, but flattening and distension of the adjacent soft tissues.* In his second Scientific Report, Dr. Bashford has published drawings of an epithelioma of the lip to show the enormous folding up of the cancerous parenchyma, and that what at first sight appears to be a solid infiltrating growth is really an immensely extended superficial growth, folded up into a ball, filling at first the narrow space it acquired for itself by pressing aside the yielding tissues of the lip and then projecting on the surface. (Fig. 1.)

FIG. 1.

Squamous celled carcinoma of the lower lip in a man. The growth is a folded and crumpled sheet intercalated between the outer and inner surfaces of the lip. Shows folding of skin (*a*) and mucous membrane (*b*) over the margins of the growth, with great lateral displacement of the normal tissues adjoining either margin.

Bormann has shown that the papillæ immediately next the growing edge of an epithelioma of skin or tongue are not exaggerated in size or cell activity, but are compressed and stunted. These observations run right athwart the commonly received notion that as soon as epithelial or other cells have acquired "malignant" properties they burrow deep into the surrounding tissues, and that the similar adjacent cells also show active growth (Fig. 2) and a readiness to participate in the disorder, as if "infected" by the malignant tendency. Unless Bashford's and Ribbert's statements are erroneous, they afford a demonstration that cancer cells in their growth give a qualified obedience to the law which regulates and controls the growth of the normal cells from which they are derived.

But if the first effect of cancer cells upon their neighbours is to compress them, their second and far more important power is to *invade the adjacent tissues.* This power of infiltration, as it is called, or permeation, is so well recognised that I need only mention it. The growth may penetrate even to bone and marrow, and in doing so cells, or groups of living cells, pass into lymphatic or vascular channels, and are carried along by the slowly or swiftly moving stream therein, and may lodge in distant parts and develop into metastases. But they may not do so. Handley's studies of the process of

FIG. 2.

Squamous celled carcinoma of the lower lip in a man. Shows sharp demarcation of the growth from the adjacent skin (*a*) and mucous membrane (*b*). At (*a*) the elongated epithelial papillæ of the skin are displaced by pressure of the growth; they are also being undermined and will be pushed off. At (*c*) the hair follicles already show displacement from pressure.

lymphatic permeation have shown us that the passage of a cancer cell along a lymphatic is attended with great peril to it, the lymphatic endothelium has great power of cancer destruction, and for every cancer embolus that resists it successfully and thrives and multiplies—bursts through the lymphatic wall and develops as a metastasis—many a one falls a prey and dies. The same holds true of the hæmo-vascular embolisms. These have been studied by Borrel, Haaland, Bashford, Murray, Tyzzer, and others, and the resisting or destructive influence of the vascular endothelium on the cancer cells has been clearly demonstrated. The cancer cell when it wanders from its proper plane or sphere has to fight for its life; normally and in favourable conditions the "odds" are against it, and our post-mortem records bear abundant testimony to the ability of the forces of resistance to these cell intrusions to limit the disease in many cases to the area originally attacked, even up to the death of the patient from the disease. While, therefore, we must not for a moment under-estimate the grave importance of the permeation of cancer and its tendency to develop metastases by the transference of the living cancer cells to distant parts of the organism, we must be careful to regard this in its due proportion and to remember that all infiltration and every metatasis is only accomplished at a period later than the earliest onset of the disease and after the overthrow of very real natural resistance.

In this connexion I would mention that cancer-bearing mice are not a favourable soil for the grafting of other cancerous tumours until the period at which they spontaneously develop metastases. In the earlier stages the resisting forces of the organism can hold at bay the cancer cells whether spontaneously or artificially introduced into the tissues; in later stages either form of inoculation becomes potent. The occurrence of metastases is the resultant of two forces—the vigour of the invading cancer cell and the resistance of the tissues to its development within them. This resistance may be inherited or racial, naturally acquired by age, artificially acquired—as shown by Bashford's experiments with the inoculation of various tissue-extracts—and it may be lessened by the persistent presence of a primary cancerous growth.

A very interesting fact about the influence of the

cancer cell upon its neighbouring cells is its *compelling them to form a supporting and vascular stroma for it*, of a type governed by the cancer cell and not by the stroma-yielding mesoblastic cells. Along with this, however, there is clear evidence that the surrounding cells exert an influence upon the cancer cell; this is shown by its greater vitality and power of multiplication in the young than in the old, by its more active growth in certain races or families of animals, and by its inoculability being limited to animals of the same species. Two other facts are also full of significance: In the experiments in the propagation of mouse cancer it has been shown that when a graft is implanted in a fresh family or race of mice it grows with great difficulty, and that with each generation of grafts the success increases until it often reaches 100 per cent. This must not be confused with the increased virulence of an infective organism that may be produced by passing it through a series of animals, for the virulence of the cancer cell is only raised for the one particular variety of mouse and not for others. It is a subtle influence of the host upon the introduced cancer cell which makes it more congenial to the tissues of the particular variety of mouse. And then we have the remarkable fact that Bashford discovered that in certain cases the repeated inoculation of an epithelial cancer stimulates the mesoblastic tissues of the host so intensely that the stroma becomes proportionately more and more abundant, and more and more richly cellular, while the epithelial growth lessens, until the carcinoma is replaced by a sarcoma. No more surprising, wonderful fact has yet been forthcoming from cancer laboratories than the demonstration of this "transformation" of an epiblastic malignant growth into a mesoblastic cancer, the carcinoma exciting the development of a sarcoma, and thereby being itself destroyed.

What is the meaning of all this? Remember that the escape of epithelial cells into the tissues beneath them is a physiological process. Years ago Dr. Creighton demonstrated it in the case of the breast; he also showed that these permeating epithelial cells were destroyed in the lymphatics. Permeation is not a new power of cancer cells, although it exists in them in an unusual degree. I think we can recognise in the facts I have just mentioned evidence that the cancer cell is not an alien cell; it influences, and is itself influenced by, its neighbours as a normal cell is. The mutual adaptation and mutual influence of the cancer cell and its stroma surely speak of common descent—of blood relationship, if I may use that term. If, now, we attempt to piece together these various facts, what disease picture do they make? When we consider the intimate connexion shown between cancer cells and the cells of the individual, and, perhaps, above all, the artificial conversion of a carcinoma into a sarcoma, we cannot recognise in cancer an independent parasitic growth, protozoal or other. Not only are the necessary evidences of the presence of specific pathogenic microbes absent, but both in broad outline and in particular detail the life-history of cancer is fundamentally different from that of the great host of known bacterial and other invasions. Nor is it possible any longer to see in cancer a reversion to the embryonic type of growth; that, before all else, is orderly, regular, with a long vista of development, differentiation, and functional activity. Cancer is cell life that is disorderly, irregular, with a minimum of development, differentiation, and function. Still less can we find a satisfactory explanation of this great disease in a circumstance so accidental, so trivial, as the sudden awakening into activity of entirely supposititious "embryonic rests."

WHAT IS CANCER?

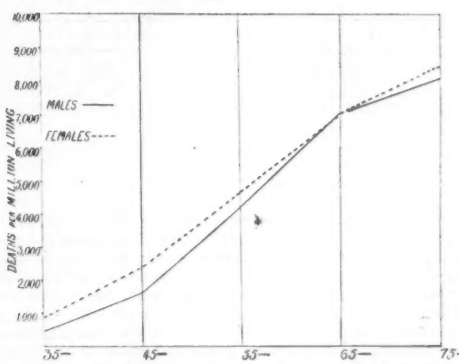
What, then, is cancer? Before answering the question, think of the fertilised human ovum, a single nucleated cell. Picture it dividing into 2, 4, 8, 16, and 32 cells, all similar in size, form, and structure. Trace on these cells as they multiply by division and see them silently range themselves in the three primary embryonic layers—epiblast, mesoblast, and hypoblast, and by that step effect a separation of cells which to our senses appear identical, but whose destiny marks them out as absolutely distinct. Follow on the wonderful drama of development, try to realise the orderliness of it all, the varying differentiation of epithelia, endothelia, and connective tissues. Observe the intimate association of these embryonic layers in the evolution of parts and organs, their perfect coöperation, their mutual dependence. See the rising up here of mesoblast into papillæ, ever clothed with epiblast, and there the down-growth of epiblast or hypoblast into glands ever supported and nourished by mesoblast. Know that all this goes on with unerring precision, but with almost endless variation in proportion, with countless differences in form and function of cell, with an ordered cycle of chemical changes so wide in its range, so varied in its detail, that we seem to be only at the threshold of a knowledge of it. Remember that this development proceeds with measured step to a certain definite extent only, that then in spite of all kinds of variation in supply and demand, and of adverse and favourable conditions, a certain level of cell life and growth is maintained for a more or less determined period, and that then first here, then there, the processes seem to abate and fail, the flame of life seems to flicker until the unknown and wonderful changes of age draw on. I have failed to bring up before you a tithe of the marvels of the full development of a man from a single fertilised cell, or of the equally marvellous maintenance of his full manhood through the years of maturity and of the gradual decline into old age. But even in my faulty picture of it we see the outworking of a wondrous law, obedience to which brings perfection of development, of life, and of health.

Now summarise our facts about cancer. Consider the disproportionate multiplication of certain cells, their imperfect, irregular, and useless differentiation; their failure to form Altmann's granules, their excessive affinity for and need for potassium, their insistent intrusion into surrounding tissues, their imperfect coöperation with the other cells, and, finally, their selfish greed which enables them to live when other cells are failing and perishing for lack of nourishment—what is it all but a failure of, or a revolt against, that great cytological law or impulse which first manifests itself in the primary division of the ovum, and lasts on till the death of the organism? Cancer is not a disease attacking the body from without, it is the result of a breach or failure of fundamental cell law; a law of which we know only the results; a law so majestic that obedience to it results in perfect development, perfect health, the full measure of days, and disobedience to it may slowly spell out all the inscrutable woes of cancer.

Let us look now at certain conditions which are known to exert an influence on the causation of cancer, and see what confirmation they afford to this view of the nature of cancer.

1. *Age.*—And first it is fully established that cancer is greatly influenced by age. In man its incidence rises with

FIG. 3.



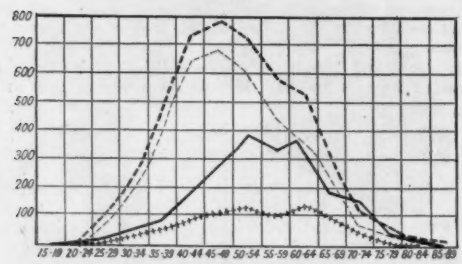
Mortality from cancer per million living at each of five groups of ages from 35 years upwards (1906).

each decade after the third. Of animals this is as true as of man. Thus the average life of mice in laboratories is three years, and sporadic cancer occurs almost invariably only after they have reached the age of two. It is from India, where the cow is a sacred animal, and is allowed to live to old age, that we have most evidence of the occurrence of

cancer in that animal. What we have so long known in the case of man, therefore, must not be regarded as in any sense an "accident" or peculiarity in him—it is one of the fundamental facts of cancer. (Fig. 3.) Cancer is undoubtedly a disease that generally arises in cells that are growing, or have grown, old. But senility of tissue is not a necessary condition of its growth, and indeed is not a favouring condition. Who of us has not been impressed by the terribly rapid advance of the disease as it occurs in young adults? Who has failed to notice the equally slow and difficult progress it makes in some old people? Of all conditions which influence the rate of progress of cancer in any particular site, I know of none more potent for mischief than the youth of the individual. From the cancer laboratories we get most definite statements that it is in young mice that cancer grafts grow with most certainty and with most rapidity. So important is this that Bashford has had to point out that, before a just comparison can be made between the results of inoculations under varying circumstances, it is absolutely essential that the experiments should be carried out in animals of known age and of the same age. Now this fact—supported alike by clinical human experience and by experimental animal experience—teaches us that the condition precedent to cancer is not in the nutrition of the tissues outside the cancer cell but within the cancer cell itself. The external conditions for the growth of the cancer cell are more favourable in the young than in the old, and a cancer cell having once started on its errant course can profit to the full from the greater nutritive vigour of the young. Incidentally this fact is a strong indication that cancer is not an infective disease, allied to bacterial invasions. So far as is known of them, old age is not a favouring factor; and it is the veriest negation of all our knowledge of these diseases that a condition favourable to their origin is unfavourable to their spread.

2. *Sex.*—It is well known that cancer is more frequent in women than in men, and that its incidence increases earlier, and attains its maximum sooner in them than in men; after the age of 70 the incidence is practically the same in the two sexes. The greater frequency in women is due to the special liability to the disease of the generative organs of that sex. (Fig. 4.) I have prepared a chart founded on the

FIG. 4.



Unbroken line = cancer in males Thick broken line = cancer in females. Thin broken line = cancer of uterus, vagina, vulva, and breast only. Crossed line = cancer in females, excluding cancer of uterus, vagina, vulva, and breast.

statistics of the Middlesex Hospital (see Third Report from the Cancer Research Laboratory). The chart shows the close parallelism of the cancer curve in women and in their generative organs only, and the near approach of the curve for women, when we exclude disease of their generative organs, to that for men. In other words, the different incidence of cancer in the two sexes is not a sex difference affecting all the body tissues, but is the result of the special liability to the disease of organs possessed by one sex only. Now these organs—chiefly the breast and the uterus—have a definite functional life which does not correspond at all with the life of the individual, but starting at about 14 usually begins to terminate about 50, and during those years these organs are the seat of frequently repeated periods of great cellular activity followed by periods of decline and atrophy. It is, I believe, because of this fact, that these organs are specially prone to cancer as they get old—before the rest of the woman ages—and so we see the explanation of the facts that cancer is more frequent in women than men, and that its age-incidence differs in the two sexes.

3. CHRONIC IRRITATION.

Of the reality and importance of chronic irritation as a condition precedent of cancer I cannot stay to speak, nor need I: the facts are too well known. Attempts have been made to find the underlying cause of cancer when it follows chronic irritation in some change in the subepithelial tissues, and the Hunterian lectures of my colleague, Dr. Victor Bonney, on this subject are no doubt fresh in your memory. He showed that interference with the continuity and perfection of the subepithelial elastic tissue layer always preceded a carcinomatous growth, and, conversely, that cancer never originates in perfect normal tissue. It has been objected that his beautiful preparations fell short of a demonstration, that the changes shown were antecedent to the earliest development of cancer, and that they were as compatible with consequence as with precedence. It is, however, surely a striking fact that these changes are only met with at the seat of the primary growth and in the nearest lymphatic glands, and not in the true secondary growths. But while accepting Dr. Bonney's demonstration, I think we cannot for a moment regard any change in the subepithelial tissue of a part as the sole or most significant change in what have been well called "precancerous conditions." The essential features of such chronically irritated and precancerous tissues are increased cell formation associated with defective differentiation or cell development, and the changes in the subepithelial tissues may be either a result of this or another expression of similar nutritive changes.

The cytological effects of what we call chronic irritation are essentially two—increased cell multiplication and defective intracellular metabolism. Now the life of a cell is not to be expressed in periods of time, but in terms of its multiplication or proliferation. An epithelium does not become old because its individual cells have existed for a particular length of time, but when the multiplication of the cells necessary for its maintenance has been repeated a certain great number of times. Therefore chronic irritation, by adding to the frequency of cell division, is producing the special condition of cellular old age; it is, indeed, equivalent to the ageing of a tissue. Its other effect is equally significant. The imperfect cell development and metabolism carried on for generation after generation of cells is clearly akin to senile defects in cell growth and metabolism, as shown, for instance, in diminished secretion and in the impairment of all nervous functions. The word "irritation" is rather apt to suggest a stimulating process; it is important to remember that chronic irritation is the most effective mode of hastening on changes closely akin to, though not identical with, those of old age—the conditions in which we have seen cancer to occur most often.

4. *X Rays.*—Prolonged exposure to X rays may undoubtedly cause cancer. The evidence of the influence of X rays upon cell life is most important. Lazarus-Barlow and Somerville Hastings have shown that in the ova of Ascarides exposed to X rays the division of the cells is more rapid than in "controls," while fewer of the ova come to maturity. If we look at the hands of an X ray worker we see the same thing—increased production of epidermic cells, with imperfect development of the too numerous cells. Think of this progress carried on and on, will it not cause a premature ageing of the formative epithelial cells, associated with an imperfect elaboration of the cells?

5. *Alcohol.*—The last etiological factor to which I can refer is alcohol. To some extent this causes cancer by directly or indirectly inducing chronic irritation; but let us note that it is a protoplasmic poison—that is, a substance which directly interferes with, and mars, cell metabolism and cell life. The influence of alcohol on the incidence of cancer is really important. Dr. Tatham's statistics of the mortality of various occupations from certain diseases revealed the fact that cancer is twice as frequent among brewers and London publicans as among clergymen, and that the cancer incidence in any trade varies with the attendant habits as regards alcohol. Dr. Newsholme has dealt with this subject in the light of figures obtained from the United Kingdom Temperance and General Provident Institution, and has shown that the mortality from cancer

among the insured in that institution, if represented by the figure 100 among the non-abstaining males, would be represented by 72 among the abstainers. He laid emphasis upon the fact that this statement was based upon scanty evidence; I have therefore endeavoured to increase the evidence, and Sir Thomas Whittaker has very kindly brought the figures up to date; and the following table, which is prepared in identically the same manner as that given by Dr. Newsholme, shows that from the larger number of lives the same conclusion is to be drawn:—

United Kingdom Temperance and General Provident Institution.

Ages of insured persons and of persons dying in each group.	Aggregate population or years of life at risk during years 1891, 1896, 1901, and 1906.		Deaths during the years 1891, 1896, 1901, 1906. From all causes.		From malignant diseases.		From malignant diseases (males alone).		Ages.
	Abstainers' section.	Non-abstainers' section.	Abstainers' section.	Non-abstainers' section.	Abstainers' section.	Non-abstainers' section.	Abstainers' section.	Non-abstainers' section.	
Under 24	2,314	445	6	2	—	—	—	—	—24
25—34	8,559	4,140	23	23	—	—	—	—	25—34
35—44	13,406	9,005	58	58	1	4	1	4	35—44
45—54	15,645	13,571	143	177	20	14	20	14	45—54
55—64	12,475	14,000	229	365	20	38	20	33	55—64
65—74	6,858	8,833	301	516	22	64	20	50	65—74
75—	2,121	2,736	274	408	13	20	12	17	75—
—	61,378	52,730	1,034	1,549	76	140	73	118	—

PRIMARY CANCER NOT ALWAYS SINGLE.

It comes to this, then, that all these so-called causes of cancer—age, chronic irritation, X rays, and alcohol—agree in being conditions that wear out the cells of a part; they add to the number of cell generations, they deteriorate the evolution of the individual cell, they appear to lessen the hold over the cell of the great primal cell law, and so they cause cancer. One objection that may well be raised to this view lies in the occurrence of primary cancer as a single lesion. It is easy at the first blush to find in this a complete refutation of what I have been trying to establish. But the more I have thought of this objection the less convinced I am of its worth. A physiological essay *de senectute* would be very valuable. Wherein lies the true essence of senility? Is it simultaneous in all our tissues? Are we animated illustrations of Oliver Wendell Holmes's "wonderful one-hoss shay"? And, if not, if one organ or tissue may grow old before its fellows, are we quite wise in holding that all the individual cells of a given organ must grow old together?

But we must not lose sight of the fact that cancer is not always single in its primary seat. My colleague, Dr. Young, among others, has published a number of instances of multiple primary cancer in the Fourth Report of the Middlesex Hospital Cancer Research Laboratory. In my limited experience I have seen such cases as these: in one case a woman presented three cancerous growths in her left breast, all of them noticed at the same time, no one of them larger or notably different in any way from its fellows. I removed the breast, and have one half of it on the table before me. Three times I have been consulted by women with a tumour in each breast, small, far distant from each other, and, except for enlarged glands in the axilla, without evidence anywhere of metastasis, so that I could only regard them as simultaneous primary cancers. One of these patients submitted to amputation of both mammæ in 1899, and has remained without evidence of metastasis until now, so that it is reasonably certain that in her case one breast was not infected from the other. Many times I have seen cancer occur in the breast at an interval after removal of the opposite breast when there was no evidence of metastasis elsewhere, and the subsequent progress of the case was so exactly similar to the disease occurring in one breast only, that I was forced to see in it a new attack of the disease, and not the development of a metastasis from the earlier tumour. Twice over it has happened to me to be called to do colotomy for chronic intestinal obstruction that had become complete, and in which examination of the rectum revealed a stenosing growth within easy reach of the finger, but further examination showed a second independent, annular carcinomatous growth, in one case in the descending colon, and in the other in the transverse colon.

Last year I was consulted by a patient whose left breast had been removed for cancer in 1902; she had had three subsequent operations. She came to me complaining of an extremely severe pain along the distribution of the ulnar nerve, and I found a very dense, and firmly fixed lump of growth close to the coracoid process. I advised her to try what radium would do to relieve her pain; immediately after exposure to radium for 48 hours, carried out by Dr. Finzi, she lost all pain in the arm and hand, and it never returned. The radium was applied on a few subsequent occasions in the hope that it would lead to the disappearance of the growth—of this happy result I saw no proof; but meanwhile an epithelioma developed in the left labium majus, ran a rapid course, and was the cause of her death in December, 1909.

In the lip I have, on several occasions, seen two or more quite independent primary growths, and in June last I saw a very early epithelioma of the tongue which proved, when subsequently removed by Mr. Spencer, and examined by Dr. Bashford, to be starting from four separate centres. Of multiple rodent ulcers I have had very numerous instances. Multiple epithelioma in lupus and in X ray dermatitis is also well known, and from Kashmir we are told of multiple kangri cancer. Were I, on the other hand, to try to give you any adequate conception of the irregular incidence of old age, I should need a separate lecture and a much wider knowledge than I can even pretend to possess. But let us take one example—and that the best known of all, the hair—what numerous varieties in the senile changes in the hair we see! It may fail to grow without change of colour; it may lose its colour and persist in growth; again, these variations may affect the hair in one part of the body only, or in small areas only, or even be limited to the product of a single hair follicle. If age can thus influence the growth of certain hair-forming epithelium, why may not the age-effect that leads to cancer start in a single epithelial cell?

IMMUNITY.

The only other aspect of the cancer problem to which I would refer is expressed in the word *immunity*. This word is specially associated with the processes by which we are enabled to withstand successfully the attacks of pathogenic organisms. It is clear, however, that if cancer is not due to any similar cause, but arises from a failure to continue the cellular development of a part exactly in accordance with the pattern of normal growth, we must not look for immunity from this disease along the lines in which we find it for infections. Careful search by many observers has failed to find evidence in cases of cancer of the activity of these protective forces which play so great a part in the life-history of infective diseases. In the last Croonian lecture at the Royal College of Physicians Dr. Andrewes gave a very full account of the part played by leucocytes in protecting against infection. There is no like tale to be told of their activity and power against cancer. Blood changes there are in the *late stages* of the disease, when other factors than the presence of a malignant growth are active, but none of a protecting character have been demonstrated in the early stages of cancer, when that disease alone is present to disturb the harmony of nutrition. We have in this another fact which strengthens the contention that cancer is not an infection disease. If the disease differs wholly in nature from those infections in which immunity has been chiefly studied, the problem of cancer immunity will also be different.

Accepting the view of cancer that I have tried to submit to you, cancer immunity might be evidenced in one or more of the following ways:—

1. The power of living cells to conform to the law of normal development and to avoid that increased multiplication,

defective differentiation, and tendency to intrude themselves into, and grow in, neighbouring cell territories, which together connote cancer.

2. Opposition to the intrusion of cancer cells into, and their development in, heterologous tissue.

3. Inhibition of the growth of cancer or destruction of living cancer cells.

What can we say under each of these heads? Does clinical experience or experimental pathology throw any ray of hope across the dark sea of malignant disease? They do. The deep impress of the primal laws of development holds the cells of our tissues in true and loyal obedience to the very end, in the almost infinite majority of cases, and in the large majority of individuals. The incidence of disease, and immunity from its initial attack, are of course complementary, and the same fact can be expressed either in terms of disease or in terms of immunity. Thus the public have been distressed by the oft-repeated statement that 1 out of every 8 women who reach the age of 35 dies subsequently from cancer; and of the men who attain 35 years, 1 of 13 dies from cancer! This no doubt is true, but we can express the same fact in terms of immunity, and say that 7 out of the 8 women and 12 out of 13 men of 35 years of age will not die from cancer! This is the great initial fact of cancer immunity—that in spite of added years, and of all the unfavourable conditions which tend to wear down the obedience of cell life to its fundamental laws, 90 per cent. of men and women who pass down the hill of life hold this dread enemy at bay. The two ways of quoting our cancer statistics always remind me of a scene in that incomparable allegory which we all had read to us in our childhood, and therefore too often put aside in our maturity. You remember, sir, that when the Pilgrim is taken into the Interpreter's house to have some of the mysteries of human experience explained to her she is shown, to use Bunyan's inimitable words, "a room where was a man that could look no way but downwards, with a muck-rake in his hand. There stood also one over his head with a celestial crown in his hand, and proffered him that crown for his muck-rake; but the man did neither look up nor regard, but raked to himself the stones, the small sticks, and the dust of the floor." The 1 in 10 of failure that our pathologists tell us of is "muck-rake lore"; the 9 in 10 of success in the great drama of cell-life is like the angel's crown—it is immunity.

Of the second kind of immunity—the opposition to the intrusion of cancer cells into the heterologous tissue—we have plenty of evidence. There is first of all the difficulty in cancer grafting, and then the fate of many of the cancer cells and minute cancer emboli that get into lymphatics and blood capillaries; the majority of them are overwhelmed by the opposing influence of the endothelial cells, and only one here and there is ever able to survive. Or let us recall our clinical experience of the very slow progress of many cancers, of their long-enduring limitation to their primary site, in some cases, and of the extraordinarily long period—amounting to ten or even more years—that may elapse between the removal of an active cancer and the development of a metastasis. Do not all these well-established facts tell us that the organism is not left powerless, defenceless, before the intruding cancer cells, and that the opposing foes are not so unevenly matched as students of the failures of these saving powers—the "muck-rake" students—would persuade us? There is a force of immunity which can protect, and does protect, against the chief mischievous power of malignancy; and when a surgeon asserts that every case of cancer can be cured by a sufficient and sufficiently early operation, I can assent when I remember the reality and the efficiency of this force of immunity, which is his great ally.

The third form of immunity is what is popularly known as the "cure of cancer"—*the disappearance of cancerous growth*. Those who are studying the disease in mice report to us that in these animals it is quite a frequent occurrence for a grafted cancerous growth, after attaining some size, to slowly shrink and disappear, and in some series of experiments a large proportion of the grafts that have "taken" have, after a period of growth, spontaneously vanished. Among the 500 sporadic cases of mouse cancer observed by Bashford this event has been witnessed only two or three times. In human pathology, I fear, it is a still less frequent fact, *but it undoubtedly is observed*. It is most frequently seen in the gradual absorption and disappearance of small secondary nodules in the skin and subcutaneous tissue. It is occasionally witnessed on a grander scale. Many years ago I showed a patient at meetings of the Clinical Society of London who recovered spontaneously and completely when she seemed to be at death's door from cancerous deposits in the lung and the neck of the femur, secondary to cancer of the breast. She remained well for several years; unfortunately, I have been unable to trace her for the last four years. More recently I have had an equally satisfactory and striking case.

A woman, aged 52 years, was admitted to my cancer ward of the Middlesex Hospital on Feb. 28th, 1906, suffering from advanced cancer of the uterus; that organ was fixed in the pelvis, the cervix was ulcerated, and masses of growth were felt invading the anterior wall of the rectum; she suffered from constant discharge and irregular hæmorrhages. In February, 1907, I find this note: "The vaginal cervix is the seat of a nodular growth, which is hard, but apparently not ulcerated; it extends all round the cervix and infiltrates the posterior wall of the vagina and anterior wall of the rectum. There is also some extension down the left vaginal fornix. The uterus is fixed." She became slowly but steadily worse, and for many months was unable to leave her bed, owing to frequent hæmorrhages and the consequent weakness and the pain, which movement increased. In the early summer of 1908 she gradually lost the use of her lower limbs, and the paralysis extended to both upper limbs until she was literally unable to move hand or foot. My colleague, Dr. Campbell Thomson, kindly examined her on several occasions and satisfied himself that the paralysis was due to exaggerated peripheral neuritis. During the late summer she improved, and when I returned from my holiday at the end of September, 1908, I found that she could just move her hands a little; she was also stronger, with less pain and less discharge, and a local examination showed that the uterus was less firmly fixed than before. Not to weary you with details, the patient got quite well, all the local evidences of disease vanished, and I made this note in July, 1909: "Uterus is small, senile; vagina narrowed at its upper end, vaginal cervix very small, no ulceration or growth to be felt in cervix or vagina; uterus is mobile. The original disease has entirely disappeared."

After keeping her for several months to make sure of her recovery we had to discharge her from our Cancer Charity as she no longer fulfilled the necessary condition of suffering from cancer, and she now earns her living by needlework.

Here is another case:—

(*a*)[1] A trained nurse discovered a lump in her left breast in 1896 when she was 46 years of age. In June, 1897, Dr. Anderson of Faversham removed the breast, and in September, 1898, he removed a lump from the axilla. In January, 1899, she came under the care of Mr. Farnell of Eastbourne, who removed a recurrence in the axilla and two or three nodules in the skin. In May of the same year he thoroughly cleared out the axilla, as there was evidence of more extensive disease there. In November, 1899, and in March, 1900, he excised small recurrences in the axilla. In May, 1900, he again operated upon the axilla and found it impossible to remove the growth under the arm. I saw this patient in September, 1900; the wound in the axilla was unhealed, and there was a firmly fixed mass of growth just below the clavicle; the upper limb was greatly enlarged from œdema. Mr. Farnell and I advised the patient to submit to a certain treatment, which was forthwith carried out. The wound quickly healed; the œdema of the arm and all evidence of the presence of a growth disappeared.

I saw this patient last month, after an interval of ten years, and found her enjoying excellent health; the scars of her numerous operations are the only sign that she has ever been the subject of cancer.

Here is another case:—

(*a*) A single woman, aged 41 years, was admitted under my care in January, 1900, with cancer in both breasts. The disease had been noticed on the right side for two and a half years, and there had been ulceration for a year and ten months; on the left side it had been known to exist for six weeks, and the lump had doubled in size in that time. The disease infiltrated the entire right mamma and the skin covering it, and fixed the part to the ribs beneath; there were enlarged glands in the right axilla and beneath the lower end of the right sterno-mastoid muscle. Several nodules of secondary growth were scattered around the primary growth, and above the nipple was an ulcerative surface measuring 2¼ inches by 3¼ inches. There were also two areas of marked venous congestion of the skin, one below this breast and one over the pectoral muscle towards the point of the shoulder. In the outer part of the left mamma was a firm infiltrating mass the size of a large walnut, and in the left axilla were enlarged and tender glands. On Jan. 31st an operation within the abdominal cavity was carried out. Within three weeks the congested areas I have mentioned had become pale, the ulcer was healing, and the secondary nodules were smaller. By March 9th there was no nodule to be felt in the left breast, and I could only detect in that axilla one tiny gland the size of a buckshot; on the right side the lower half of the breast was free from all evidence of growth and the ulcer was healed. By March 27th all that was left of the originally extensive disease were two or three very small nodules of the skin of the chest. On April 18th symptoms of intestinal obstruction developed, an operation was performed, and I regret to say that this patient died quite suddenly while some adhesions were being separated. At the necropsy a few small nodules of growth were found in the subcutaneous tissue over the right breast. No other traces of cancer could be detected. A nodule removed in March presented characteristic appearances of spheroidal carcinoma with a relatively large amount of connective tissue.

[1] Cases marked (*a*) were treated by double oöphorectomy.

Here is another good case:—

(*b*)[2] A woman, aged 57 years, was first seen by me in July, 1903. Her left breast had been removed for carcinoma in April, 1900; four operations for recurrence had been performed since. There was a very considerable local recurrence, enlargement of the third costal cartilage, deposit in the lower flap and under the arm. All the growths have disappeared, the patient is in good general health, and continues at her work. I have seen her from time to time during the last seven years, the last time in October of this year; she was then quite well, except for a little superficial ulceration, which seemed to be due to the treatment that had been employed.

Here is a somewhat similar case:—

(*b*) A woman, aged 44 years, was first seen by me at Middlesex Hospital in September, 1909. Her right breast had been removed for carcinoma. There was an extensive secondary deposit in the chest wall with a wide and deep ulcer. Under treatment this ulceration rapidly cleaned and healed, and the growth has disappeared, leaving a very little thickening to be felt where before there was a mass of deposit.

Her health is quite good and she does all her work.

(*b*) A woman, aged 43 years, was first seen by me in May, 1909. Her left breast had been removed for carcinoma. There was a considerable secondary mass of growth in the lower flap and under the axilla. Under treatment the deposit has steadily decreased in size, and in November of this year there was only a slight thickening to be felt.

Her health is good and she is doing full work.

(*b*) A man, aged 44 years, was sent to me from another hospital as an incurable case in December, 1903. A columnar carcinoma of the rectum had been removed by Kraske's method. There was local recurrence of the disease, and a mass of growth the size of an orange protruded from the sacrum. Thirteen months later—January, 1905—the following note was made: "Good general health, doing all his work (as a postman), no sign of disease." In August this year, 1910, he was seen again, and gives this history. At the end of 1905 there was noticed a warty condition of the old scar; this ulcerated. It was removed, and proved to be a squamous epithelioma. The wound healed well, and he has had no further trouble.

He continues his work as a postman, and enjoys good health. He was seen in October of this year, nearly seven years after his first visit.

Several years ago I excised the left superior maxilla of a woman for cancer. Some months later her attendant in the country sent her back to me at the hospital with extensive recurrence; the cavity left by the removal of the bone was filled with a mass of growth. A year later the doctor asked me to see his patient again, and to my delight I found her in excellent health, and without a trace of the local disease.

(*b*) Another case that I can never forget was that of a woman who had had her left breast removed for cancer and subsequently came to the Middlesex Hospital Cancer Charity with local recurrence, growth in the glands of the neck, and a large brawny arm. She got quite well, and was able to earn her living again at the wash-tub. I had another similar case where the "brawny arm" got quite well, and all the recurrence of the disease disappeared.

THE HOPE OF CURE.

This is not an exhaustive list of such cases that I have myself seen, and I am sure that my experience is not singular. In some of them the disease was not "cured" in the sense of being wholly and permanently removed, but in several there is strong reason for thinking that this word "cure" may be justly used. In many of the cases treatment directed to this end has been carried out; in some there has been no special treatment. In my brief records of these cases to-day I have not mentioned the treatments employed, because my present purpose is not to vaunt a remedy but to state a fact—that cancer, even when advanced in degree and of long duration, may get better, and does sometimes get well. *There is cure of cancer*, apart from operative removal.

All therapeutic cures are obtainable only by the working of physiological forces, and the first hope of therapeutic success comes with the observation of the efficiency of unaided Nature to accomplish cure. You may say to me there is little comfort in all this; you enunciate a philosophical concept, and you tantalise by a record of very rare exceptions in the grey, grim drama of cancer. Not so. These cases, rare though they be, are the sun of our hope. In the darkness of night it is everything to know that there is a sun towards which the earth is revolving, and that if we fix our eyes on the East we shall soon see the grey promise of the dawn and then the many-coloured heralds of the golden sun itself. And as the victims of cancer call to us in the dark night of despair, "Watchmen, what of the night," oh! it is much to know that for cancer-stricken man there is also a sun of healing. We envy the astronomers who know so well the laws regulating the movements of the spheres, that they foretell the happenings of the universe with a precision that is the despair of workers in all the other branches of natural science. But with all their knowledge of these laws they cannot hasten on the day, or affect in one small circumstance the movement of a planet, or alter the destiny of a single grain of meteoric dust. But when the biologist shall know the laws that govern cell-growth, with a knowledge akin in its sweep and accuracy to that of the astronomer, he will have power—the power to prevent, to control, to cure, cancer.

[2] Cases marked (*b*) were treated by Roentgen rays by my colleague Mr. Cecil Lyster.

CONGRESS IN BERLIN.—A National Congress for the Study and Prevention of Infantile Mortality under the auspices of the *Gouttes de Lait*, will be held in Berlin from Sept. 11th to 15th, 1911. The committee of organisation will have charge of the Infants Department of the International Hygiene Exhibition to be held in Dresden from May to October, 1911. The general secretary is Dr. Kellner, professor and director of the Kaiserin Augusta Victoria Hospital at Charlottenburg.

FOREIGN UNIVERSITY INTELLIGENCE.—*Düsseldorf* (*Academy of Practical Medicine*): Dr. Bruno Oertel, *docent* of otology and laryngology, has been granted the title of Professor.—*Giessen:* Dr. Otto Kuffler has been recognised as *privat-docent* of Ophthalmology.—*Göttingen:* Dr. Fromme, assistant in the Surgical Clinic, has been recognised as *privat-docent* of Surgery.—*Gratz:* Dr. Alois Materna has been recognised as *privat-docent* of Pathological Anatomy.—*Halle:* Dr. A. Eberth, professor of pathology, proposes to retire at the close of the current session.—*Heidelberg:* Dr. Ernst Kürz has been appointed Director of the Institute of Forensic Medicine in succession to Dr. Knauff.—*Königsberg:* Dr. Arthur Brückner, *privat-docent* of ophthalmology and surgeon to the ophthalmic clinic, has been granted the title of Professor.—*Leipsic:* Dr. Heineke has been appointed Extraordinary Professor and Director of the University Surgical Clinic in succession to Dr. Perthes, who goes to Tübingen.—*Lyons:* Dr. Courmont, *agrégé*, has been appointed to the chair of General Pathology and Therapeutics.—*Naples:* An Academy of Marine Medicine is to be established with departments for Naval Surgery, Tropical Diseases, and Climatology.—*Tübingen* (*Medical Missionary Institute*): Dr. Fiebig, the recently appointed director, has been obliged by illness to resign the post.—*Valencia:* Dr. Juan Campos Fillol has been appointed Adjunct Professor of General Pathology.—*Vienna:* Dr. Karl Fleischmann has been appointed Director of the Rothschild Hospital.—*Warsaw;* Dr. S. M. Maximovich has been appointed to the chair of General Pathology.

MEDICAL JOURNALISTS' CONGRESS.—The first Congress of French Medical Journalists, which has been organised by the Association of French Medical Journalists, will take place in Paris on March 23rd, 1911. The President is Dr. Maurice de Fleury and the secretary-general is Dr. Cabanès, whose address is 9, rue de Poissy, Paris (5e). The subscription is 6 francs, except to foreign members, who do not pay any subscription. This amount is payable before Feb. 1st, 1911, to M. Le Sourd, 49, rue Saint André des Arts, Paris (6e). The Congress will be held in the hall of the Hôtel des Sociétés Savantes, rue Danton, Paris, and will begin at 9 A.M. on the date fixed. The questions on the agenda are as follows: (1) On the Right of Reproduction of Medical Articles, opened by M. Vitoux; (2) Relations of the Medical Press with Congresses and other Movements of Interest for the Art and Practice of Medicine, opened by M. Ausset; (3) Organisation of an Immediate Reserve or Benevolent Fund, opened by M. Duchenne (Chatel-Guyon); and (4) Usurpation of the Title of Doctor, opened by M. Dieupart. The titles of communications intended to be presented to the Congress must be sent to the Secretary-General before Feb. 1st, 1911. A dinner by subscription will also take place the same evening at 7.45 P.M. Special reductions in railway rates may be obtained by members of the Congress travelling over the French railway companies' systems, by filling up and returning a form which will be supplied by the secretary of the Congress upon application.

The Bradshaw Lecture
ON
THE RESULTS OF BRONCHIAL OBSTRUCTION.

Delivered before the Royal College of Physicians of London on Nov. 1st, 1910,

BY G. NEWTON PITT, M.D. CANTAB., F.R.C.P. LOND.,

PHYSICIAN TO GUY'S HOSPITAL AND LECTURER ON MEDICINE.

MR. PRESIDENT AND GENTLEMEN,—My first duty is to thank your predecessor in the chair for the honour he has done me in nominating me for this lectureship to-day, and to express the diffidence I feel in choosing a subject on which it may seem there is not much that is new to be said.

We are met to-day to do honour to the memory of Dr. William Wood Bradshaw, who, it would appear, was a man of wide interests; he contributed papers on such subjects as the use of cod-liver oil in chronic rheumatism, on narcotics, on abdominal abscess, and other non-professional articles to the *Miscellany* and elsewhere. Born at Bristol in 1801, according both to Foster's "Alumni Oxienses" and to the inscription on his grave, he was educated at the Westminster and Middlesex Hospitals, taking his M.R.C.S. in 1833. In the early part of the same year he became M.D. Erlangen. He became an Extra Licentiate of this College in 1841, after examination by the President and the "Elects," which entitled him to practise beyond seven miles from London. In 1854 he was elected a Fellow of the Royal College of Surgeons of England. In 1859 Dr. Coplans Hawkins and Dr. R. P. Smith nominated him as a Member of this College, which nomination was approved. At the mature age of 43 he matriculated at Newton Hall, Oxford, and was granted a degree in 1847 without any examination. He married the widow of a wealthy jeweller at Andover, and, according to Mr. Rickman Godlee, to whom I am indebted for his portrait and for much of this information, her money was to be left away in case she re-married; but they bought the reversion, married, and settled down at Reading. He seems to have been a cultivated, refined, somewhat eccentric man with a rather theatrical manner, and never did much practice. He died in 1866; his widow founded a lectureship at each of the Colleges in order to perpetuate his memory.

THE RESULTS OF COMPRESSION OF A BRONCHUS.

The results of compression of a bronchus may be the following.

1. The lung may be slightly reduced in size. There may be definite diminution in the entry of air, but the resonance may be unaltered, and even post mortem beyond an increase in the amount of mucoid contents, and a diminution in the amount of air in the lung, this may be all that can be observed even when there has been definite pressure on the tube.

2. The chest may be hyper-resonant, the lung over-distended, and the diaphragm displaced down abnormally. This occurs only with partial obstruction of the tube when respiration is vigorous, and will be discussed under the results produced by aneurysm.

3. The lung may be reduced in size, airless and solid from collapse. The chest will be dull on percussion. This results when the obstruction to the tube is complete or when respiration is feeble. It may occur within a few hours, and was studied by Lichtheim by observing the effects of introducing foreign bodies into the bronchi so as to completely block them, but practically complete obstruction is generally due to other causes and rarely to the presence of a foreign body. In the early stage the bronchi beyond the obstruction are empty. The lungs in the first and second conditions also tend gradually to become more or less airless.

4. The bronchi become filled with retained secretions, at first chiefly mucus, but catarrhal changes soon ensue, cells accumulate, together with purulent and inflammatory products.

5. Secondary inflammatory changes take place, due partly to the entry of secretions into the alveoli, so that what has been called a retention pneumonia ensues; the alveoli fill with catarrhal cells and giant cells appear, although they are unconnected with tubercle, as has been shown by inoculating animals with the products. When alveolar walls remain long in contact, organisation with obliteration takes place and new connective tissue is formed. The bronchi normally often contain a few staphylococci and streptococci, which when retained in suitable media begin to develop, with the result that pyrexia and a more or less acute pneumonic change develops.

The changes that have taken place so far may all pass away and leave but little damage; but two further changes soon take place—a general fibrosis of the lung beyond the obstruction and a bronchiectasis. These ultimately develop, whatever be the initial process, if the obstruction persist.

6. Dilatation of the tubes. This does not take place equally in all the tubes obstructed, and its distribution is largely determined by local causes. When only one branch of a bronchus has been pressed upon, the dilatation is limited to the tubes in its area. Generally the tubes at the posterior and lower part of the lung are the most affected, probably because the secretion tends to stagnate there and set up local destructive changes as the patient is in the semi-recumbent position.

Normally there is a constant secretion of mucus in the bronchi, which passes imperceptibly out into the larger tubes and thence to the trachea, but we are quite ignorant what is the amount normally secreted in 24 hours. When a bronchus is occluded the mucus at once begins to accumulate and is capable of being secreted under pressure, so that as with an obstructed gall-bladder the tubes become over-distended. Now bronchial contents cannot pass through the bronchial wall on account of the basement membrane; they can only pass out by the bronchus, or be sucked back by inspiration into the alveoli which remain patent, and so on into the lymphatics and the glands. Normally the contents pass almost entirely by the bronchus, because the initial act of expiration consists in the contraction of the lung by its own elasticity, which as the alveoli empty drives the secretion out of the smaller bronchioles into the larger tubes, to be then carried on by the forcible muscular expiration. With a collapsed lung this initial mechanism fails. As the alveoli become blocked, there is a greater suction on those that remain, and this leads to further occlusion of the alveoli, but the movement of the chest on the affected side is always more or less feeble. The result is that, whether the lung is distended or collapsed, the bronchi become distended with mucoid or muco-purulent contents under high pressure, and hence the walls yield. Owing to the interference with the circulation, which is largely dependent on the suction of the alveoli as they open up with inspiration, the arteries being on the proximal and the veins on the distal side, the tissues are insufficiently nourished, and this, added to the local irritation, causes the bronchial walls to deteriorate, so that the elastic and muscle fibres tend to disappear and local dilatations occur.

It is an old controversy as to whether inspiratory or expiratory efforts are the more efficient in the production of bronchiectases, and I am sorry to say that at the present day the latter theory seems to have the more advocates. In the cases under consideration it is difficult to see how violent expiration, compressing the lung forcibly, as with a cough, can throw any greater strain on the inside of the bronchi than it does on the outside. If the same pressure is applied all round the wall of a bronchus it cannot tend to dilate it. The increased pressure of the contained air is the result of the pressure applied to the outer surface of the bronchus. On the other hand, if it is borne in mind that aspiration is applied to the surface of the lung by inspiration, which tends to open it up, and if the alveoli fail to respond, strain is thrown on the deeper parts such as the bronchi; if there is no obstruction they open up and fill with air from the trachea, but when the bronchus is obstructed they must be subjected to strain which tends to dilate them. The feebleness of the respiratory movements spares them greatly, but the contracted condition of the lung tends to set up an inspiratory dyspnœa, and paroxysms occur from time to time, especially with exertion, which must aspirate the tubes and gradually make them dilate.

Consequently we do not find marked dilatation except when there is also in these cases definite fibrosis. The slighter degrees of dilatation are associated with but slight consolidation of the lung. The presence of pleuritic effusion

usually inhibits, or entirely prevents, the dilatation of the bronchi, because the lung not being in contact with the pleura is no longer held up by capillary attraction between the two surfaces, and therefore is not subjected to so much aspiration. There is no evidence that connective tissue in contracting is capable of producing traction on the tubes at all comparable with that exercised by the powerful suction action of inspiration. It was noted many years ago by Dr. Charlton Bastian that in one-fifth of all cases of cirrhosis of the lung the tubes are not at all dilated. This is what might naturally be expected, as respiration would probably be feeble in many, but if the fibroid change were the essential cause of bronchiectasis it would be inexplicable.

It has been suggested that the accumulated weight of the contained secretions will suffice to distend the terminal tubes when a bronchus is compressed by an aneurysm. The terminal tubules are not the ones that are especially dilated, and the tubules lie in a closed box, the chest, and are supported outside by the same pressure as that inside them. The pressure inside the chest may be slightly increased, but there is no difference between the pressures inside and outside the bronchi, which is the important factor.

The essential factors which lead to dilatation of the tubes would therefore appear to be local changes in the walls, the accumulation of secretion under tension, and the effects of inspiration on a lung which is not capable of expanding satisfactorily.

7. Fibroid thickening of the lung. There are several factors which conduce to this result: inflammatory and organising connective tissue changes result (*a*) from the retention of the secretions, (*b*) from the prolonged collapse of the alveoli, (*c*) from the broncho-pneumonia, (*d*) from the peri-bronchial changes which follow on the destruction of the bronchial epithelium, which generally takes place, and finally (*e*) from the interference with the pulmonary and lymphatic circulations which normally depend on the opening up and the contraction of the alveoli. Moreover, when we bear in mind that in health the alveolar surface of each lung amounts to 100 square metres, each air cell being bathed in a film of blood 10μ in thickness, we can realise what a difference it must make to the nutrition of the tissues when the alveoli fail to open and the amount of the circulating blood is enormously reduced; hence retrograde fibroid changes must gradually develop. The fibroid change is therefore also a natural sequence of obstruction, but the causes are not quite the same as those which produce the bronchiectasis.

8. Secondary infections producing a septic pneumonia breaking down into abscesses are not infrequent and vary with the cause; in some they are essential and early, in others a late and accidental development.

9. Gangrene. This especially occurs with malignant disease and when the pulmonary artery is occluded. The communication between the bronchial and pulmonary arteries is a free one, but varies in different cases, and hence gangrene does not always occur even when the pulmonary artery is compressed. The condition may also result from a very virulent infection.

10. Putrefactive changes. Although the bronchi are often dilated, the contents are not always foul. The change is always a serious one, as it accelerates the destructive changes in the lung and introduces a severe toxic poison into the system; the organisms are usually anaerobic, and hence are but rarely cultivated.

11. As a secondary result of the bronchiectasis, especially if foul, there may be a pleurisy or an empyema.

Although stridor is a symptom that at once attracts attention, it is to be noted that it was present in but a very small proportion of the cases examined; it is marked when the trachea is involved, but otherwise was noticeable in only two or three of the cases of growth and aneurysm, yet severe dyspnœa was common.

CAUSES OF BRONCHIAL OBSTRUCTION.

Bronchial obstruction may arise from causes without or within the bronchus. Usually only one bronchus is affected, but in some cases the trachea is involved, as well as one or both bronchi. The external causes producing compression are:—

1. Aneurysm of the aorta (35).
2. Malignant disease (56).
   (*a*) Bronchial glands—
      (1) Primary, usually sarcoma (26);
      (2) Secondary to growth at a distance (6).
   (*b*) Œsophagus, epithelioma (16).
3. Enlarged caseous or suppurating glands (12).
4. Gummata (2).
5. Abscess (3).
6. Dilated left auricle (1).

The internal causes are:—

1. Bronchiolitis.
2. Syphilitic ulceration with scarring (5).
3. Primary malignant disease of a bronchus (usually columnar-cellel carcinoma) (8).
4. Foreign bodies in the bronchus (8).

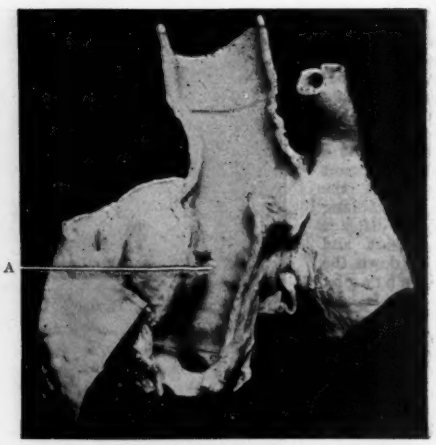
The material I propose to discuss is collected from our records at Guy's Hospital, and I desire to thank my colleagues for their kind permission to refer to cases under their care. I shall only discuss the general results and give a few illustrative cases.

ANEURYSM OF THE AORTA.

During the period taken, out of 11,000 post-mortem examinations there have been 140 aneurysms of the thoracic aorta. Thirty compressed the left bronchus, and 16 of these eroded into it; five compressed the right bronchus and none eroded it. To contrast the results of compression produced by the various causes it may be noted that in this series, 16 cases—i.e., one-half—there was bronchiectasis beyond the obstruction, but in only eight was it associated with a marked fibroid thickening of the connective tissue and increased pigmentation of the lung with a thickened pleura. In several (6) there was also an acute terminal pneumonia, and in four an acute septic pneumonia; in 3 there was an acute gangrene, and sometimes there was an acute pleurisy, but only once was there a pleuritic effusion. When there was no definite dilatation of the tubes the lungs generally showed bronchi full of muco-purulent secretion, often with collapse and a more or less airless lung.

The dilatation of the tubes takes place only in the part of the lung beyond the obstruction and is irregularly distributed, being generally least marked in the anterior part. The amount varies greatly; in some cases the distension of the tubes is but slight, when the lung may be also collapsed or pneumonic. Marked increase in the fibrous tissue, as it occurs less frequently, appears to be to some extent a secondary change and to be partly set up by the absorption of the irritating contents. In advanced cases the fibrous trabeculæ stand out, the lung is very tough, and may be riddled with inter-communicating cavities. In only one in 12 was an acute gangrenous condition noted, although in many the contents were very foul. The bronchiectasis requires at least two or three months in which to develop, but occasionally it took a year or more, and it is very remarkable how very latent the constitutional symptoms may be so long as the changes are limited to the fibroid lung beyond the obstruction. When much foul secretion is expectorated the healthy part of the lung is apt to become infected, and if an acute

FIG. 1.



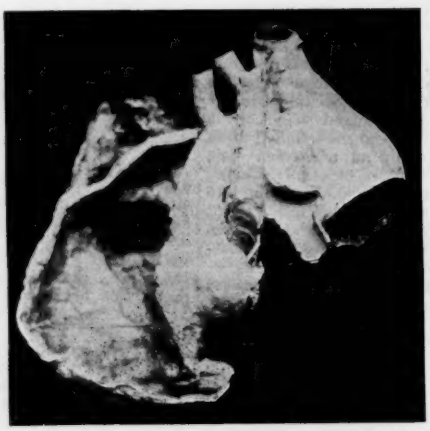
Trachea and bronchi opened from behind to show that an aneurysm of the transverse part of the aorta presses on the anterior and outer part of the left bronchus. In this case the aneurysm is just beyond the transverse arch and has ruptured into the bronchus at A.

septic pneumonia develop the disturbance to health is intense.

The *ascending arch* is not in very close relationship with the right bronchus, and only occasionally will an aneurysm of this part (usually a saccular one) compress the bronchus, and then on its anterior surface; not infrequently it will also involve the trachea; in none of the cases did it rupture into the bronchus. Occasionally the azygos vein, which is in close relation to the right bronchus, may also be compressed, and this may be the explanation of the only case with pleuritic effusion. In none of the right-sided cases did the breath sounds entirely disappear, nor did a local bronchiectasis develop.

A sac connected with the latter part of the *transverse arch* may compress more or less completely the left bronchus on its outer and anterior surface, and often the trachea as well, and very rarely the left pulmonary artery which lies above the bronchus (Fig. 1). This arterial stenosis probably accelerates retrograde changes in the lung and the development of the fibroid thickening, but it did not in any case lead to gangrene. In no case did an infarct form, and in only one did an aneurysm rupture into the pulmonary artery. When the aneurysm comes off lower down it will compress the bronchus from behind and on its outer side (Fig. 2).

FIG. 2.



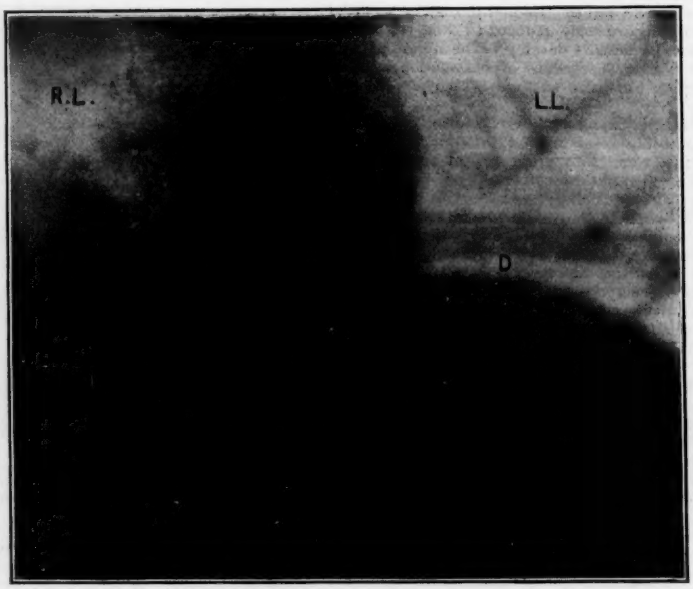
A similar specimen with an aneurysm of the descending aorta; laid open, this is seen to lie on the posterior surface of the left bronchus which it compresses.

Sometimes, however, before the bronchus is completely occluded the lung will become over-distended, there will be a hyper-resonant note, and the distended lung may displace the heart and push down the diaphragm. That this condition may result has been almost entirely overlooked by authors, and no reference is made to it in the text-books. Yet over-distension we know not infrequently results if the respiration is vigorous, when there is laryngeal obstruction in diphtheria, in tracheal obstruction from an enlarged thyroid, thymus, or aneurysm, in asthma with spasm and therefore, with stenosis of the smaller bronchi, and in acute bronchitis and bronchiolitis.

It is also what we might expect. With inspiration the chest expands and the surface of the lung closely attached to it by capillary action follows, and the air is sucked past the obstruction as the lung attempts to open. With expiration there is a contraction of the lung due to its elasticity, which is feeble but sufficient for ordinary purposes. This drives the air from the smaller to the larger bronchi, because the pressure in the former is the greater. When forcible expiration is applied, the bronchi as well as the lung tissue are compressed with an equal pressure; if there is no obstruction the air passes on and the pressure therefore falls in the larger bronchi. When an obstruction exists, however, this mechanism fails, the air has greater difficulty in escaping than it had in entering, and the lung becomes over-distended. The pressure may be so much raised that the diaphragm may be displaced two inches and the heart pushed out of position.

This condition gradually develops and persists for a certain time, but by degrees the bronchi fill with secretion, thus increasing the difficulties of the ingress of air, and as the contained air is not replaced, and is subjected to high pressure, it becomes absorbed by the pulmonary blood, while the lung becomes solid, airless, and dull on percussion. Lichtheim has shown experimentally that when the bronchus is completely occluded this airless condition develops almost at once.

FIG. 3.



Skiagram of the chest taken from the front, showing the greatly over-distended left lung due to pressure on the bronchus by an aneurysm. The left lung is over-transparent, the diaphragm is pushed down, and the heart is pushed over to the right. R.L., Right lung. L.L., Left lung. D, Upper edge of diaphragm on left side.

In six of the cases the symptoms were so suggestive of pneumothorax that this diagnosis was more than once suggested.

This possibility of over-distension as a result of bronchial obstruction has been so far overlooked by all authors that the only definite recognition of the condition I have noted is by the late Dr. Pearson Irvine, who, in the Pathological Transactions for 1878, recorded a case of aneurysm pressing on a bronchus in which the lung was larger than normal, although fibroid and bronchiectasic; he came to the conclusion that the result of the pressure had been first to over-distend the lung, that then secretion had accumulated in the bronchi, and the air had been absorbed, while fibrosis and bronchiectasis had resulted from the greatly increased tension, which had compressed the blood-vessels and impaired

the nutrition of the tissues. C. Jacobsohn has also more than once noted that the position of the dulness produced by a growth at the root of the lung may vary with respiration owing to the over-distension of the affected lung, which is best shown by the X rays.

CASE 1. *Saccular thoracic aneurysm compressing the left bronchus and producing an over-distended lung.*—By some it was thought that the case was one of pneumothorax. The patient was a man, aged 29 years, admitted in November, 1905. He had been in the army and had had syphilis. Cough had been present for a year and had been worse for the last three months, with dyspnœa and pain in the left chest. He had no great distress while in bed; the left chest moved badly; there was no tactile vocal fremitus, and no voice nor breath sounds on the left side. On percussion, the note was hyper-resonant. There was no cardiac dulness on the left, and on the right there was dulness, which varied with respiration, extending from the fourth rib out to beyond the right nipple and down to the liver. There was marked epigastric pulsation, the heart sounds were faint, and no bruit was audible. There was compensatory breathing over the right chest. There was considerable uncertainty with regard to the diagnosis, but it was thought that most probably the condition was due to an aneurysm pressing on the left bronchus. The patient was examined with the X rays. The whole of the left side of the chest was remarkably transparent compared with the right; no foreign body was visible; the heart was displaced nearly 2 inches to the right of the sternum with deep inspiration, and back again behind the sternum with expiration. The diaphragm was depressed on the left side, but no trace of any aneurysm could be seen. (Fig. 3.) The temperature was normal and the pulse 72. There were no stridor, no evidence of any syphilitic ulceration of the trachea and bronchi, and no expectoration. It was elicited that three

FIG. 4.

The bronchi laid open from behind. A. Small saccular aneurysm can be seen opening into the descending aorta, compressing and almost occluding the left bronchus, through which a glass rod, A, has been passed.

months previously a crust of bread had gone "the wrong way," but had this passed into the bronchus there would have been evidence before now of septic pneumonia. The extreme translucency and distension of the left chest, with the absence of any change in the aorta, threw a doubt on the diagnosis of aneurysm, and it was thought that a possible explanation of such marked translucency might be a pneumothorax, although no bruit-d'airain could be elicited, and there was no evidence on the screen of a lung compressed by air. The left axilla was explored with a Southey's tube, but no air escaped. The result of this exploration was to produce an acute attack of pleurisy, and he felt very ill for some time. His temperature two days afterwards was 99° F., and on the next day 101·6°, with a pulse of 112 and intense pain. The temperature did not reach the normal again for nine days.

In December the patient was tested with tuberculin with a negative result. Later his opsonic index to tubercle was 0·38. As the condition still remained obscure, the chest was again explored in December with a negative result, except that there was again a sharp attack of pleurisy with pyrexia which lasted for ten days, when the condition again quieted down. At the end of December, 1906, there was an impairment of resonance developing at the left base; there were still an absence of air-entry, diminished tactile vocal fremitus and voice sounds. He now developed pain, with sweating at night, cough, and expectoration, and at the apex behind

FIG. 5.

A section of the corresponding lung showing the reduced size of the lung with fibrosis and bronchiectasis, which has resulted. The fibrous trabeculæ stand out, and there is in addition a destructiv ecavitation in the posterior part of the lower lobe.

there were distant breath sounds. A somewhat tympanitic note was noticed near the cardiac area. No tubercle bacilli could be found. During the next month or two he had a large amount of muco-purulent expectoration which was not foul. In February he began to develop slight clubbing of the fingers, and a rub was audible over the left chest. On Feb. 27th he had a rigor with a temperature of 105° and a leucocytosis of 33,700. He had a sharp attack of pleurisy lasting for ten days. In March the impulse of the heart had returned to the left side of the sternum. There were consonating râles at the back of the left lung and not much difference between the note on the two sides.

FIG. 6.

A piece of over-distended lung showing lines of interstitial emphysema.

It was at first difficult to explain the attacks of severe pleurisy which followed both attempts at exploration. It was clear afterwards that infective fluid from the distended bronchi had inoculated the pleura, as doubtless owing to the great pressure under which it was retained some leaked into the pleura from the puncture. Had the lung not been under tension it would probably not have set up any infection. The

obstruction to the bronchus was not complete as there was expectoration, although the movement was so feeble that we could not hear air being sucked up to the surface of the lung. It is noticeable that so long as the lung remained quiet, and before it became fibroid, so that the contents did not pass into the lymphatics but remained in the lung, or were expectorated, the patient remained free from fever, yet the faintest trace in the pleura set up a violent reaction.

His symptoms gradually quieted down, and he continued fairly well. I did not see him from April, 1906, to the end of February, 1907, when he was seized with general pains, pyrexia, and troublesome cough. Soon the expectoration became abundant and extremely foul, so that he vomited frequently. On readmission he was very ill and feeble. The left chest was contracted; the movement was deficient; there was an impaired note at the apex and below, and also in the axilla it was dull. Over the upper spaces the air-entry was deficient and broncho-vesicular; below it was lost. Numerous râles were audible, with compensatory breathing on the right side. The pulse was irregular, 108; the impulse was dragged three-quarters of an inch outside the nipple by contraction of the lung. A diagnosis of gangrene of the lung was made. The condition proved fatal on the 26th, three days after admission

Post mortem a saccular aneurysm opening just at the commencement of the descending aorta had compressed the left bronchus and produced a condition of fibrosis of the whole of the left lung with recent septic broncho-pneumonia. (Fig. 4.) There was bronchiectasis of the tubes beyond the compression, with cavitation due to recent putrefactive infection, which was most marked in the posterior part of the lower lobe. (Fig. 5.)

Until I saw this case I was quite unaware that a partial compression of a bronchus was capable of producing an over-distended lung, which might be confused with pneumothorax.

CASE 2.—The patient was a man, aged 30 years, who was admitted with bronchitis and intense dyspnœa, which soon proved fatal. The trachea was found to be compressed by an aneurysm of the transverse aorta. The lung was enormously over-distended (Fig. 6) and had ruptured, producing interlobular emphysema, as shown by the lines of the interlobular septa which, when fresh, were distended with air, but now are collapsed and empty.

I am indebted to Dr. E. W. Martin for the two following skiagrams which excellently illustrate my contention. Fig. 7 represents a chest taken from the back. The left side is uniformly transparent; the intercostal spaces are wider than on the right. The diaphragm is flattened and displaced downwards and the heart to the right. The aneurysmal dilatation of the arch, with the marked excursion of pulsation, is well shown. There were well-marked signs of an aneurysm compressing the left bronchus. The condition was diagnosed on account of this skiagram as pneumothorax with aneurysm, but the appearance is really due to an over-distended lung. This will be at once apparent if we contrast it with an equally good skiagram of a pneumothorax, also taken so long ago as 1902 by him. (Fig. 8.) Here the air space is more transparent than was the over-distended lung, but the lung, shrunk up near its root, is obvious, due to a ruptured phthisical cavity above this, which was wanting in the other picture. The heart and diaphragm are more displaced, and the latter has a much sharper outline.

[Since the lecture Dr. Martin has been able to obtain for me the following notes of the case, which was in Victoria Park Hospital in 1902. There was pulsation over the upper part of the sternum, with a dull note. The note over the left chest was resonant; no cardiac dulness; apex beat was one inch to the left of the sternum in the fifth space; the heart sounds were very feeble, but best heard on the right of the sternum; extremely feeble breath sounds all over the left chest, it hardly moves at all, and the whole chest, back and front, is larger than the right. An exploring syringe was introduced into the seventh space on the left side, and connected with a tube under water, when about 30 bubbles of air escaped. The condition at that time was considered to be one of pneumothorax and aneurysm. The escape of the bubbles of air naturally suggested this; the skiagram, however, is definitely that of an over-distended lung, and I am supported in this view by Dr. Hugh Walsham. The air must therefore have escaped from the interior of the lung itself, and the explanation is that it must have been retained under great pressure, which is also indicated by the condition of the lung.]

FIG. 7.

A skiagram of chest taken from behind showing over distended, abnormally transparent left lung due to aneurysm compressing left bronchus. A, Aneurysm. B, Heart displaced to right. D, Left diaphragm displaced and flattened.

CASE 3. *Aneurysm compressing the left bronchus. Signs at one time suggesting pneumothorax.*—The patient was a man, aged 39 years. In October, 1906, there was pain behind the sternum. The physical signs on admission left it doubtful whether he had pneumothorax or an obstruction of the left bronchus. There were cough and stridor, there was deficient movement of the left side, but it looked enlarged. Some hyper-resonance was present. There were no tactile vocal fremitus and no breath sounds, and the voice sounds were diminished; on the right side there was compensatory breathing. The heart sounds were not well heard on the left side, but were better than normal on the right side. On Dec. 15th a skiagram showed slightly increased opacity in the region of the aorta. On Jan. 7th there was no dulness; no breath sounds were audible over the left chest. In February breathing was audible behind in the upper part, but the cardiac impulse was not palpable. In March there was a better entry of air into the left lung with a few râles. The impulse was in the sixth space one inch outside the nipple. On March 14th the left base was becoming dull; when the patient went out in May the left chest had an impaired note with deficient breath sounds. Fatal hæmoptysis occurred a few weeks later.

CASE 4. *Saccular aneurysm compressing and eroding the left bronchus; high-pitched note over the left chest; signs suggestive of pneumothorax; fibrosis with bronchiectasis.*—The patient, a man, aged 38 years, had had cough and pain in the chest for six months. The left chest was *less flattened* than the right, there was defective movement, and a *high-pitched note* all over on the left side. There was no cardiac dulness and no dulness in the axilla. Voice sounds were deficient and breath sounds absent. Behind, the *left chest bulged more* than on the right; there were diminished tactile vocal fremitus and voice sounds. The chest circumference was 36 inches and the expansion three-quarters of an inch. The heart sounds were indistinct, but were best heard behind the sternum and to the right. Diagnosis: growth or pneumothorax. The temperature oscillated between 102° F. and normal while the patient was in the hospital. On April 26th, 1902, the chest was *smaller*, being only 34 inches, and there was a slightly impaired note over the præcordium. Fatal hæmoptysis occurred.

Post mortem a saccular aneurysm was found opening into and compressing the left bronchus. There was a septic pneumonia of the left lower lobe, with fibrosis and bronchiectasis.

CASE 5. *Aneurysm of the descending aorta opening into the left bronchus. ? Pneumothorax or aneurysm.*—The patient, a man, aged 38 years, had dyspnœa and pain with impaired movement and absence of breath sounds on the left side; there was a hyperresonant note and the heart was displaced to the right. On Sept. 20th, 1897, there was some dulness at the left base. Fatal hæmoptysis occurred while the physician was preparing to explore. ? Pneumothorax or aneurysm.

Post mortem there was an aneurysm at the commencement of the descending aorta, which had opened into the left bronchus near the point of bifurcation. The lungs were mottled with blood that had been sucked in; the edges were emphysematous. The lower lobe was solid, mottled grey-green, with a quantity of odourless pus in the tubes.

CASE 6. *Aneurysm compressing the left bronchus; left lung over-distended, the signs suggesting pneumothorax.*—The patient had a well-formed emphysematous chest, the left side being *more bulky and larger* than the right and moving scarcely at all. No apex beat could be felt; there was a slight pulsation in the third right space 1½ inches from the edge of the sternum. There was a *hyper-resonant note* in the left chest obliterating the cardiac and the splenic dulness. Breath sounds were absent on the left side and very faint at the apex; there were no tactile vocal fremitus, no voice sounds, and no bruit d'airain. The circumference of the left chest was 18 inches; at the level of the right nipple 17½ inches; at the level of the left 17¼ inches. There was no movement on the left side. Diagnosis: pneumothorax due probably to the rupture of a phthisical cavity. The temperature was remittent. Later the note at the left base was slightly impaired.

The following is a remarkable instance in which the patient survived 20 months after the first severe hæmorrhage from the erosion of the aneurysm into the bronchus, the opening being probably a valvular one, which he was able to close by retracting his head and thus diminishing the antero-posterior diameter of his chest.

CASE 7. *Aneurysms of the aorta, one compressing the left bronchus, and another the trachea; recurrent hæmoptysis for 20 months before death.*—The patient, a man, aged 50, under the care of Dr. M. Parry-Jones of Derby, had four years ago dyspnœa on exertion, when an aneurysm was suspected; 20 months before death hæmoptysis (one pint) occurred; the blood came more rapidly when he leaned forwards, and was checked when he drew back his head. He also noticed that turning his head to the right reduced the volume of his right pulse. Gradually a slight pulsation with a diastolic jog developed beneath the left clavicle. There were diminution of breath and voice sounds on the left side, but no dulness. There were four further attacks of hæmoptysis amounting to several ounces during the next year, but by reducing his fluid to 13 ounces and keeping quiet he kept them in abeyance.

FIG. 8.

Complete pneumothorax left side; heart displaced in front of sternum. D, D, Diaphragm displaced and flattened. B, Right lung subject of caseous tubercle. Note the wider intercostal spaces on the left side.

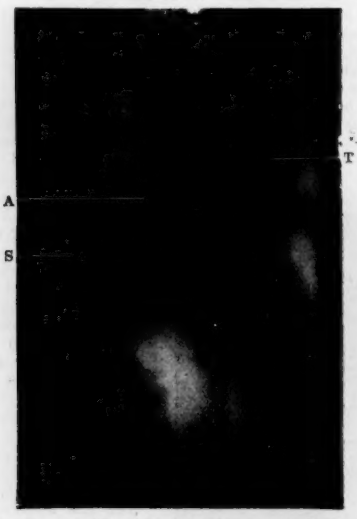
Three dilatations were found involving respectively the ascending, transverse, and descending portions of the arch. The opening into the air tubes was closed up. There was no great bronchiectasis. It is remarkable he should have survived the first rupture for 20 months.

CASE 8. *Saccular aneurysm of the descending aorta which compressed the left bronchus and the œsophagus.*—The patient, a man, aged 49, under the care of Dr. W. P. Morgan of Seaford, had had pain for a year in the left chest and cough for three months. Recently there had been expectoration in the morning streaked with blood. He had dysphagia, liquid food frequently coming back again into his mouth after some little time if he swallowed. Dyspnœa ensued on exertion; there was defective movement on the left side, with distension of the veins on that side of the chest. There was resonance with deficient breath sounds over the left side, and a very marked delay (almost one second) in the onset of inspiration, which was quite noticeable when a double stethoscope was used. There were deficient voice sounds and the tactile vocal fremitus note was very slightly impaired, if at all. (Fig. 9.)

The features especially associated with bronchial pressure from aneurysm may be summed up as follows: 1. The left bronchus is involved six times as often as the right. 2. The right is very rarely eroded. 3. Resonance with silence. There are deficient or absent breath sounds over the left lung with a resonant or hyper-resonant lung. This does not necessarily indicate more than a partial occlusion of the bronchus, and occasionally in an early stage the left lung may be over-distended and be too transparent to X rays. The condition has then to be diagnosed from pneumothorax. 4. With X rays dilatation of the aortic arch can generally be detected as the disease of the wall is generally multiple and diffuse. The local aneurysm often is best shown in a

view in the half-turned position with the patient sitting up. The deficient and delayed movement of the lung, the alteration in its density, and the abnormal position and movement of the diaphragm are usually obvious. Occasionally no local aneurysm nor yielding of the aorta can be detected. 5. Later, the development of an impaired note rather than complete dulness, with gradual development of bronchiectasis. It is remarkable how the amount of change which develops is always under-estimated owing to the breath

FIG. 9.



A skiagram of an oblique view, showing an œsophagus with its upper part distended with bismuth and milk. The spine S lies to the left, and the shadow of a saccular aneurysm A extending up to it can be seen compressing the œsophagus; below this point a linear trickle of bismuth alone passes. The shadow extends higher than the point of compression. T is the thoracic aorta.

sounds being absent or feeble. 6. Absence of pleuritic effusion. 7. Retardation of the onset of inspiration on the affected side. 8. In nearly half the cases more or less hæmoptysis. Pain with dyspnœa on exertion are very constant symptoms.

As soon as the mucous membrane ulcerates the liability of the contents of the bronchi to become freshly infected is greatly increased, as the spot is very apt to become a nidus for organisms itself. Hence necrotic changes in the lung occur more often when the tube is ulcerated than when it is only compressed, just as primary growths in the bronchus are especially associated with gangrene.

MALIGNANT DISEASE (55 CASES).

The growth may originate (1) in the bronchus, (2) in the glands at the root of the lung, (3) it may be a secondary deposit in the glands at the root of the lung and grow into it along the bronchus, and (4) as an epithelioma of the œsophagus ultimately invading the bronchus.

1. Primary growth in a bronchus is rare (8); in four cases it started in the right and in an equal number in the left. The growth is generally a columnar-celled carcinoma —at least four-fifths of cases of primary cancer of the lung start in the bronchial mucous membrane. Most of the cases came under observation for pleuritic effusion, which not infrequently required tapping more than once. In half the cases gangrene of the lung developed. In some a fragment of growth was expectorated, and thereby its malignant nature determined. There are generally pain and pressure signs.

2. Growth in the glands (26 cases) half affecting each bronchus. Two were described as lymphadenoma, but as they eroded the bronchus it is more probable that they also were sarcomatous.

3. Secondary deposits in the glands at the root of the lung (6 cases); the growth compressed the bronchus and invaded the lung.

4. Epithelioma of the œsophagus (16 cases). The two bronchi are invaded with equal frequency. In four they were only compressed; in the others the growth had fungated in. With epithelioma the pulmonary condition rapidly proves fatal, with a septic pneumonia, abscess formation, or gangrene. Bronchiectasis and fibrosis have not time to develop. The rapidly fatal changes are due to the infection with food from the communication with the œsophagus. The food is doubtless often squeezed in by the contraction of the œsophagus owing to the obstruction of its tube beyond by growth. In one case a deposit in a gland led to compression of the lower branch of the left bronchus with the development of bronchiectasis beyond. A troublesome paroxysmal cough, pyrexia, and pain are the indications of the onset of trouble in the lung to which foul expectoration is soon added.

The special features of malignant disease are the frequency with which pleuritic effusion and also gangrene develop (more than half). The effusion is an early sign, and both this and the collapse of the lung, as well as the growth itself, all give dulness which is often quite marked. It has been pointed out by writers that the physical signs given by the changes in the lung and the pleura are obvious at an early stage and tend to obscure the evidence of the growth itself. In many the pulmonary artery is also compressed and may be occluded, and this much more frequently so than by an aneurysm; hence the rapid development of extensive patches of gangrene which may lead to the development of large cavities, often without fibroid thickening of the wall. In a small proportion fibroid changes in the lung are well marked; in others there has not been time for them to take place. Bronchiectasis is by no means always present, but only in one-third.

The massive infiltration of the root of the lung occludes not infrequently the lymphatics and blood-vessels as well as the bronchi: hence œdema of the pulmonary tissue tends to develop and the bronchi to become more rapidly overfull of secretion. Stridor is not infrequently present, especially on exertion, but is most marked when the growth has also compressed the trachea.

FIG. 10.

The left lung presents a large cavity the anterior wall of which was torn on removal. When fresh the walls were flocculent, but unfortunately in preparing the specimen they have become smooth. A probe A can be seen projecting through the remains of the bronchus; the pulmonary artery was also involved.

CASE 9. *Squamous epithelioma of root of the lung with destructive disease of the lung beyond.*—The patient was a man, aged 65 years, who for 20 months expectorated material of the colour of strawberries and cream, at one time amounting to a pint a day. The only physical signs owing to the occlusion of the bronchus were deficient breath sounds over the left base.

Post mortem the left lower lobe of the lung was excavated out into a cavity 4½ inches across, with necrotic, flocculent walls; there were numerous dilated bronchi in the rest of the lobe with fibrosis. The bronchus and pulmonary artery were compressed, being embedded in the mass of growth. The

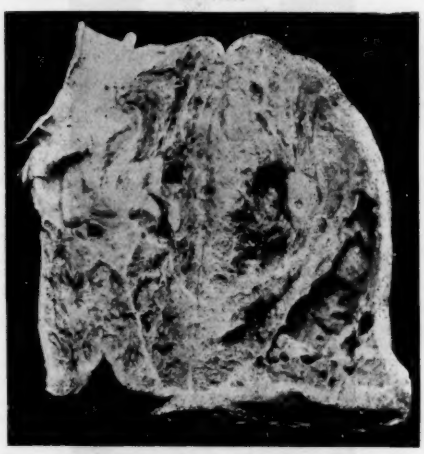
primary seat was not determined as the post-mortem examination was limited to the thorax (Fig. 10).

This specimen is of interest as showing the early formation of a single large cavity from destructive changes from necrosis, and in this instance without any foul secondary putrefactive changes. It illustrates the fact that the physical signs of a large cavity over 4 inches across may be almost *nil* when there is stenosis of the bronchus, owing to the absence of any breath sounds. Contrast it with the extensive fibrosis and the usual absence of large cavities which result when the pressure is due to an aneurysm.

As another example showing how a mass of sarcoma growing into the root of the lung associated with occlusion of the pulmonary artery tends to form large cavities, in addition to a general fibrosis of the lung with moderate dilatation of the tubes, the following may be quoted.

CASE 10.—The patient, a woman, aged 38 years, died a few hours after admission. At the inspection the left lung was healthy. A section has been made of the right lung, with the mass of growth at its root. A rod has been passed through the much-constricted bronchus. The pulmonary artery except for a small branch was occluded. Almost the whole of the lower lobe was excavated out into a cavity. There were smaller cavities in the lower part of the upper and middle lobes with general dilatation of the tubes in a dense fibroid tissue. (Fig. 11.)

FIG. 11.



CASE 11. *Primary cancer of bronchus; expectoration of a nodule of growth; duration of symptoms three and a half years; fibrosis with bronchiectasis.*—The patient, a man, aged 40 years, first noticed some wheeziness in September, 1901, and during the year 1902 he became short of breath on exertion; he lost half a stone in weight, there was an ounce of muco-purulent secretion daily, and on exertion or deep breathing there was some stridor. The wheeze or musical whistle with expiration was loudest when he lay on his left side. He had no pain. In October there were deficient breath sounds with a slight squeak, and deficient voice and tactile vocal fremitus over the left side, with dulness in front at the apex. There was similar deficiency in breath sounds at the apex; the base was fairly normal; the right side was quite normal. With a skiagram there was a slight opacity at the left apex, but less than is often met with in growth, although the evidence pointed in that direction. There was no evidence of aneurysm. He was subject to attacks of pyrexia with an increase in the expectoration. He continued to lose weight, and towards the end of the year there was a pleuritic rub. He had a few slight rigors. In December the dyspnœa had increased considerably, and he was very frequently sick unless very careful with his diet. A rough, blowing systolic bruit developed to the left and above the heart; the resonance became more impaired above, and the breathing indeterminate, with an increase in the voice sounds. The impulse of the heart was pulled upwards and outwards. There was pulsation over the affected area at the left apex which apparently was transmitted from the heart and was not due to an aneurysm. The diaphragm was as high as the fifth rib in the axilla. During the year 1903 he was able to get about if he moved slowly. Expectoration was limited to half an ounce; it was slightly blood-stained, but never offensive. The amount of blood varied somewhat.

The patient continued fairly well until May, 1904, when he had an attack of pericarditis which lasted for six weeks. In December, 1904, he coughed up a piece of tissue an inch long and three-eighths of an inch in diameter, which came away quite easily with only a little hæmorrhage. On microscopical examination this was found to be a portion of glandular carcinoma composed of tortuous columns of columnar cells; there were also cells in alveoli which communicated with these columns. Another nodule was expectorated in the following March. On April 18th, 1905, I again saw him with Dr. R. P. Cockburn of Ealing. The patient had got worse during the last six months, frequently expectorating as much as an ounce or two of blood. The dyspnœa had increased. He was practically confined to his bed. For a long time he was unable to lie on his left side, and latterly only on his right side. There was pulsation as high as the third space above the nipple, to the left of the heart; there were a noisy, wheezy stridor and noisy expectoration. We came to the conclusion that a nodule of the growth had fungated through, probably into the trachea, and it was a question whether there was not originally a foreign body in the left bronchus which was the starting point of his trouble. He died the next day.

On post-mortem examination the right lung was found over-distended but otherwise normal; there was an adherent pericardium. There was a mass of growth at the root of the left lung in which the bronchus and vessels were embedded. No foreign body was found; the left lung was extremely contracted. The upper lobe was reduced to a mass about two inches across and seven inches long, riddled with small bronchiectasic cavities, while the lower lobe was converted into a very dense fibroid mass no bigger than the lung of a child of six and was also riddled with cavities.

COMPRESSION BY INFLAMED GLANDS (12 CASES).

The 12 cases were: enlarged glands 7, suppurating and opening into a bronchus 5. These cases occur mainly in infants in whom the glands are active and the antero-posterior diameter of the thorax is so small that a mass of glands at the bifurcation of the trachea may lead to serious symptoms, but especially when they press on the trachea. They less often compress the bronchi seriously, and this generally only occurs when there are enlarged glands on each side of the bronchus, which accounts for the comparatively few cases in which enlarged caseous glands give rise to pressure symptoms. The cases of pressure on the trachea are apt to be looked upon as due to laryngeal diphtheria, but the absence of movement of the larynx is of diagnostic importance. Their enlargement may be made out by dulness internal to root of one scapula, by the opacity shown by X rays, by the absence of breath sounds on one side, and by a venous hum over the sternum on retracting the head, although I have only been able to elicit this sign three or four times.

When a suppurating gland breaks into a bronchus the child has severe dyspnœa with violent paroxysms of cough, and may bring up some purulent secretion, while there is soon an active development in the lung beyond of fresh physical signs. When in a child there are evidences that a bronchus is compressed it is far more likely to be due to an enlarged caseous gland than to a foreign body, unless there is a definite history of sudden onset of symptoms after swallowing something. Most of the cases due to caseous glands are complicated with phthisis; less than half of them are diagnosed; but X rays make it much easier to do so now than formerly.

In 3 cases abscesses opened into a bronchus: (1) empyema, right side; (2) suppurating bronchial glands secondary to suppurative pylephlebitis; and (3) abscess communicating with the œsophagus and gangrenous cavity in the lung.

CASE 12. *Compression of trachea and right bronchus by enlarged caseous gland.*—A child, aged 2 years, was admitted to hospital in 1910 with dyspnœa and stridor, which was supposed to be due to laryngeal diphtheria. On examination it was found that there were deficient breath sounds over the right side, with impaired resonance. The larynx did not move with respiration, and compression of the root of the right lung by caseous glands was diagnosed. The child died a few hours later. A large caseous gland compressed the

trachea in front, just above the bifurcation. Another large gland between the bronchi was softening; the right lung was collapsed and airless; the left lung was normal (Fig. 12).

FIG. 12.

A trachea and bronchi laid open from behind showing the opening (A) into the right bronchus of a caseous gland (B) which had suppurated.

DILATED LEFT AURICLE.

A cause of pressure sufficient sometimes to cause physical signs during life but rarely to present much evidence post mortem is a dilated left auricle due to mitral stenosis, to which attention was directed many years ago by Dr. Wilkinson King.

CASE 13. *Pressure on left bronchus by dilated left auricle.*—In 1888 a woman, aged 50 years, was seen suffering from mitral stenosis with a greatly dilated left auricle. At the inspection there was also a softening ante-mortem clot in the appendix. The left base was airless and sank in water; it could be inflated less than the right one, which was also œdematous and engorged. Both were deficient in air. The left bronchus was markedly compressed by the dilated left auricle.

FIBROUS BRONCHIOLITIS DUE TO IRRITANT GASES.

Inhalation of irritant gases is a well-known cause of intense dyspnœa and bronchitis, not infrequently fatal, with a greatly over-distended lung, of which we have had examples from time to time. Fraenkel has shown that this condition may be due to an acute fibrous obliterating bronchiolitis, which may develop within a fortnight. He has recorded cases after inhalation of the fumes of chlorine, of cow hair and lime dust, and after calcium chloride dust.

A man after inhaling chlorine had intense dyspnœa, which passed off but returned next day, when he was cyanosed, with an extremely distended lung and fine crepitations. The condition again cleared up, to return again after a week, when he died. Widespread fibrous peribronchial inflammation was found round the smaller bronchioles, with necrosis of the lining epithelium, producing constriction of the tubes with dilatation beyond. Schmorles has described a similar condition in the broncho-pneumonia of measles, with obliteration of the bronchioles. The ingravescent cyanosis with dyspnœa and a rapid and great increase in the size of the lung are the essential points, especially when there has been exposure to irritant gases.

STENOSIS OF THE BRONCHI FROM SYPHILIS.

Out of seven cases, two were due to gummata pressing on a bronchus. The way in which the tubes dilate under violent inspiratory efforts with bronchial obstruction is well shown in a case (No. 14) of a man, aged 64 years, where a gumma pressed on the upper division of the right bronchus. The upper and middle lobes were over-distended, the lower lobe was airless from compression with five pints of fluid. The illness was rapidly fatal. The second (No. 15) was a chronic case with a gumma compressing the superior cava and the right bronchus; the bronchi beyond were dilated up to their extremity and their walls were thickened; the lung was solid. There was extensive pleuritic effusion into the left side secondary to the pressure on the cava.

There were five cases of cicatricial stenosis of the bronchus secondary to syphilitic ulceration, and the patients were all under the age of 40. In two the larynx was also involved, in four the trachea, and in four there was bronchiectasis. Stridor is generally present, but often is independent of the bronchial lesion. There are generally other signs of syphilis present, so that an accurate diagnosis can be made in the majority of cases.

CASE 16.—The patient was a man, aged 38 years; he was admitted with extreme laryngeal stridor and fixed cords due to laryngeal paralysis requiring tracheotomy.

Post mortem, the left lower lobe was collapsed. There was syphilitic stenosis of the right bronchus, with scars on the trachea; the right lung was fibroid, with a dense gummatous fibrous mass involving the root of the right lung and the vagus. In spite of the vagus being involved there was no destructive disease of the lung. Sir W. Gull at one time suggested that the destructive lung disease associated with aneurysm was due to implication of the vagus (Fig. 13).

FIG. 13.

A trachea, with part of the right lung, showing syphilitic stenosis of the right bronchus, with scars on the trachea, a fibroid right lung, with dense gummatous fibrosis involving the root of the lung and the vagus.

FOREIGN BODIES.

The result of the introduction of a foreign body into a bronchus depends upon whether the bronchus is partially or completely occluded, on the vigour of respiration, and on whether the body is an organic one which will readily putrefy.

Our knowledge of the changes which result largely depend on the experiments of Lichtheim in 1878, who introduced laminaria tents into the bronchi of rabbits, and also in others removed portions of the third and fourth left ribs, ligatured the bronchus, and studied the results. He showed that when the plug completely occluded the bronchus the lung quickly collapsed and became airless. There was at once an intense dyspnœa which gradually quieted down. In many cases the animals died within 24 with pneumothorax of the opposite side from rupture of an enormously over-distended lung; in others the over-distension of the sound lung had stretched the capillaries and made them useless, equally producing a fatal result. Pneumothorax does not occur from this cause in human beings. The affected lung beyond the obstruction was of a dull brown-red colour, with the consistency of muscle. With early death the bronchi were empty, but became filled with a thick white mucoid secretion whenever the animal did not die too soon. When he ligatured the bronchus alone the same result was produced. He found that when the animal was made to breathe oxygen absorption was much quicker, in some

cases being under an hour; CO_2 absorption was less rapid but much more so than when it breathed air. When the pulmonary artery was also ligatured absorption was much delayed, showing that the gases were absorbed by the blood circulating in the lung.

When the chest was merely opened and the lung exposed to the air atelectasis took place quickly, but did not if the pulmonary artery was ligatured. This opening of the chest vitiates many of his results, as it prevented any vigorous respiratory movements from taking place. This was well shown by the fact that when the bronchus was ligatured the opposite lung did not become over-distended to the extent it did when the bronchus was blocked by a foreign body. When the hilum of the lung, including the pulmonary artery, was ligatured there was generally no infarct because there had been no suction of the blood owing to the absence of the opening up of the alveoli with inspiration. This affords the explanation of the absence of infarcts in cases of growth at the root of the lung and of aneurysm in which the pulmonary artery had been occluded by pressure. When the animal survived some weeks the lung was fibroid and converted into a sac of dilated tubes, presenting an appearance similar to that of a calculous pyelonephritic kidney.

Partial obstruction of the bronchi has not been thoroughly studied experimentally, and we have still much to learn; the presence of expectoration in amount shows that this is the more usual condition which results from the presence of a foreign body in a bronchus, and I have little doubt that in some cases the lung at first becomes over-distended, and is not always airless and collapsed.

Schuller has shown that it is possible to introduce clean food into the bronchi of rabbits, and if it can disintegrate it will disappear with no change in the lung beyond that of catarrh; when it cannot, fibroid changes with bronchiectasis result. When dirt, however, was mixed with the food gangrene or septic pneumonia resulted.

There have been the following cases: (1) head of barley grass in left bronchus 129 days; (2) pork in right bronchus possibly for six months; (3) wooden top of toy in left bronchus; (4) pea in left bronchus; (5) feather after tracheotomy, in right bronchus, but not cause of death; (6) pipe stem in bronchus after fatal fall down ladder (not cause of death); (7) newspaper in trachea, introduced intentionally; and (8) sponges in trachea, introduced intentionally.

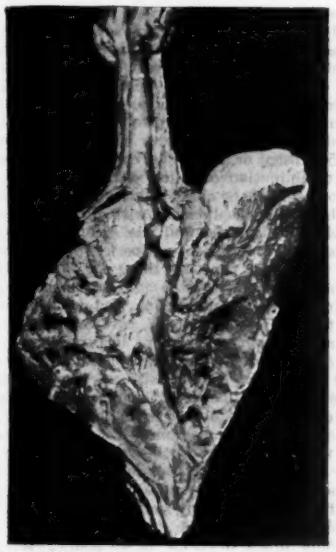
The following case presents many very remarkable features. The boy swallowed a head of barley grass during a paroxysm of coughing and this passed into his left bronchus, where it remained 129 days. He developed within two days after the entrance of the body an acute pneumonia which became gangrenous, and he had an extremely prolonged dangerous illness. Acid-fast bacilli were found on one occasion in the sputum and were assumed to be tubercle bacilli, but he made an excellent recovery as soon as he expectorated the piece of grass. He never reacted specifically to tuberculin. He has maintained perfect health for the five years since and is now strong and well.

It is very rare for anyone to make such an excellent recovery after such extensive mischief in the lung, and it is suggested that the acid-fast bacilli came from the grass as these grasses are said to contain them.

CASE 17. *Ear of barley grass in the left bronchus for 129 days; gangrene of the lung; complete recovery.*—A boy, aged 12 years, while recovering from an attack of whooping-cough, was playing with a head of grass in his mouth, when he was seized with an attack of coughing and the piece of grass disappeared. He tried in vain to make himself sick. On the next day the temperature was 102·8° F., and on July 25th (the following day) Dr. J. E. G. Calverley of Folkestone, under whose care he was, found that the temperature was 105·2°, with a pulse of 100. There was pain in the epigastrium. The entry of air at the left apex in front was deficient. On the 28th there was diminished entry over the same area with diminished movement, but a hyper-resonant note. There was tracheal wheezing, conducted over the whole chest as rhonchi. The temperature, respiration, and pulse remained high, and on the 30th the boy had consolidation at the left apex down to the third rib with bronchial breathing and pectoriloquy. The larynx was found to be normal. On August 1st there was profuse epistaxis with a tympanitic note at the left apex in front and down to the level of the fourth rib in the axilla. The entry of air remained deficient at the left apex. He became anæmic from recurrent epistaxis. He then passed under the care of Dr. R. B. Wrightson at Aldeburgh. The temperature gradually dropped to 99°, and the boy was able to get about. The sputum at first was frothy, but later became abundant and muco-purulent, and was said to contain tubercle bacilli. In the middle of September his temperature ran up to 104° and he developed signs of consolidation at the left base. In the upper lobe there was dulness at the apex with signs of a cavity in front in the second and third spaces. There was a marked oscillation of the temperature with very foul breath indicative of gangrene. He was extremely ill for a long time with a very feeble pulse. He took creasote regularly and was well nursed in the open air, so that gradually he recovered his health. No tubercle bacilli could be again detected, and at the end of October he had gained a stone in weight. The sputum was reduced to half an ounce in amount daily and was no longer foul. On Nov. 30th, 129 days after swallowing the grass, he had a fit of coughing and brought up a head of timothy grass 1¼ inches long from the left bronchus. The long awns had broken off from decomposition, and so it was able to pass out again backwards, which had been quite impossible so long as they were intact. There was a gradual retrocession of the signs, but there remained at the apex a deficient resonance, with indeterminate breathing and increased voice sounds; a few moist sounds persisted at the lower part of the lung for some time. In December the opsonic index for tubercle was found to be 0·6 and 0·65 on two occasions. An attempt was made to see whether any acid-fast bacilli could be cultivated from the piece of grass he brought up, but none could be found, although many other organisms were present.

CASE 18. *Pea wedged in lower branch of right bronchus; marked bronchiectasis of corresponding tubes only.*—The patient was a boy, aged three years, admitted with cough and vomiting. He died with empyema and cerebral abscesses a month later. (Fig. 14.)

FIG. 14.



The trachea and right lung showing a pea wedged in the lower bronchus on the right side. The upper lobe of the lung is healthy, but the rest of the lung is densely fibroid and riddled with intercommunicating cavities the result of the obstruction.

CASE 19. *Piece of pork in right bronchus; bronchiectasis; septic pneumonia.*—In 1888 a man, aged 60 years, was admitted. For six months there had been wasting, and for two weeks foul breath. For two days there had been deficient movement of the lung on the right side, pleural rub in the axilla and base, deficient air-entry, râles, with amphoric breathing over the middle lobe.

At the inspection the right lung was fibroid with general bronchiectasis of the main bronchi. Low down was found a

piece of pork ½ × ⅜ inch. There were cavities in the lower lobe. There was acute pneumonia at the lower part of the upper lobe with œdema of the left lung. Had the pork been there for six months?

CASE 20. *Piece of wood in left bronchus; bronchiectasis of both lungs.*—In 1905 a female child, aged 16 months, was admitted. She was well until five weeks before admittance, when she had a cough and dyspnœa. The right lung was resonant on the anterior part in front, but impaired behind. There were crackling râles, bronchial breathing, and pectoriloquy behind.

At the inspection there was advanced fibrosis with bronchiectasis of the right lower, the right middle, and the left lower portions, with a mass of dilated tubes in the midst of the parts of the lung which were fibroid. The *two left upper lobes* were distended; there was recent bronchopneumonia. In the left bronchus just beyond the point of bifurcation there was a smooth piece of wood broken off a toy. It was doubted at the necropsy whether the piece of wood had caused the bronchiectasis, because it was found in the left bronchus and the bronchiectasis was also on the right side, but probably at an earlier stage it was in the right bronchus, and had produced changes on that side and been displaced to the left later.

Although many cases of foreign bodies in the bronchi have been recorded, in but very few has an accurate note been made of the physical signs in the lung in an early stage of the illness. The body generally passes into the right bronchus because it is more vertical and is also slightly larger. The changes are unilateral, serious, and progressive. The following are the most important evidences suggestive of a foreign body in a bronchus, and in any such case a bronchoscope should be passed in order that the condition of the tubes may be determined, and a positive opinion formed. 1. A most important factor in diagnosis, and one which until we had X rays was absolutely essential, is the history of swallowing something immediately before the onset of an acute attack of severe dyspnœa and cough. 2. Not infrequently a whistling or wheezing sound which the patient can localise to one side, varying in quality if the object is not fixed in the bronchus. 3. Great distress, with not infrequently a constricting pain behind the sternum, made worse by movement. 4. Dyspnœa, with varying exacerbations, often intense and made worse by cough, but it may be elicited only by exertion. After a time there may be no distress. 5. Absent or, rarely, very noisy breath sounds with some slight diminution of voice and tactile vocal fremitus limited to one side of the chest. 6. At first resonance on the affected side, soon consolidation with dulness, and, after a time, the signs of cavities and the simulation of phthisis; query occasionally hyper-resonance. The physical signs sometimes vary from time to time. 7. With X rays, the defective movement of the diaphragm and of the thorax, the alteration in the density of the lung, and not infrequently the outline of the foreign body itself, may be clearly made out. 8. Delay in the commencement of inspiration as compared with that on the other side. 9. Defective movement with consequent diminution in the size of the affected side. 10. Violent paroxysmal persistent cough, which is apparently most marked when the object is at the bifurcation, as the sensibility of the mucous membrane is greatest here, as can be noticed when passing a bronchoscope. 11. Early pyrexia, which later becomes hectic, associated with chills. 12. After a short time an expectoration more or less profuse, purulent, often bloody, and later often fœtid. 13. In some there are nausea and vomiting which may be very troublesome. 14. Pneumonia often develops in 48 hours; this may be septic and may be followed by gangrene.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An Extraordinary Comitia was held on Dec. 1st, Sir Thomas Barlow, Bart., K.C.V.O., the President, being in the chair. The President announced that Sir James Sawyer had presented to the College a reproduction of the arms of Harvey. In order to procure the needful information a prolonged research had been necessary, and the thanks of the College were heartily returned to Sir James Sawyer for the gift. A communication was received from the secretary of the Royal College of Surgeons of England, dated Nov. 4th, 1910. The remainder of the proceedings were declared by the President to be secreta Collegii.

THE THEORY AND PRACTICE OF THE TREATMENT OF SYPHILIS WITH EHRLICH'S NEW SPECIFIC "606."[1]

BY JAMES McINTOSH,
GROCERS' RESEARCH SCHOLAR;
AND
PAUL FILDES.

THE demonstration by Hata of the lethal effects of "606" on spirochætes in the case of certain experimental spirochætoses led one of us (J. McI.)[2] to experiment later with it on the Spirochæta obermeieri of relapsing fever. The signal success of these experiments without injury to the animals induced us to follow the example of several eminent continental syphilologists and apply the remedy to syphilis. For this purpose, by the great generosity of Geheimrat Ehrlich, Dr. Bulloch was able to obtain a further supply of "606." We are therefore much indebted to Dr. W. Bulloch for entrusting to us its practical application.

The descriptions of the results of Ehrlich's new arsenical preparation dioxydiamidoarsenobenzol ("606") as a specific cure for syphilis and other diseases due to spirochætæ have been couched in language of admiration, which is unusual in medical literature. Alt, A. Neisser, Schreiber and Hoppe, Iversen, Pick, Duhot, Finger, Wechselmann, Michaelis, and others have all written in praise of this substance as a cure for primary, secondary, tertiary, and congenital syphilis. A. Neisser asserted that "606" was far superior to mercury or any other arsenical compound, while Uhlenhuth has discarded his efficacious mercuric atoxyl in its favour. Several of the above authors have recorded cases in which prolonged mercurial treatment had been followed without success, only to heal rapidly under "606." Such cases can be observed by anyone who has had the opportunity of using this substance. Its remarkable effects are obvious, but, nevertheless, we are of opinion that some recent authors have unduly exaggerated the speed of the natural processes of repair. "606" has, no doubt, a very definite effect upon the tissues apart from syphilis, but it cannot achieve the impossible. Some 12,000 cases have up to now been treated, with 12 deaths, a number of accidents which, occurring as they did in the experimental stage of the drug, may readily be reduced in the future. These cases, or at any rate the great proportion of them, are claimed to have been cured, that is, cured in the strict sense of the word.

In order to guard against any repetition of such disasters as followed the introduction of such potent remedies as tuberculin and atoxyl, Ehrlich determined, even in the face of criticism, to give the preparation only to individuals working in recognised laboratories, where his directions could be cautiously carried out. Thus, in the space of a few months, by means of a lavish supply of material, the first epoch, as Ehrlich himself says, has been successfully passed. The results and method of application are for the most part known. There remains the question of *permanency* only.

The Principles Underlying Chemotherapeutics and "606."

Dioxydiamidoarsenobenzol is a substitution product of atoxyl, the great feature of this new preparation of arsenic lying in the fact that the quantity required as a therapeutic dose is only a small fraction of that which can be given without toxic results following. This preparation, like several of the other substitution products of atoxyl, is the outcome of elaborate researches on the part of Professor Ehrlich and his co-worker Dr. Bertheim. The preparation of such products became comparatively simple after they had shown that atoxyl was sodium paramidophenylarsenic acid, and not sodium metaarsenious acid anilid, or, in other words, that the amido radicle was not bound up with the arsenic directly. In this way, mainly by substitution and reduction, most of the new compounds, such as acetylatoxyl, paramidophenylarsenoxyd, arsenophenylglycin, &c., have been obtained. The following graphic formulæ give the steps, according to Ehrlich, by which "606" may be obtained

[1] From the Bacteriological Laboratory, London Hospital.
[2] THE LANCET, Sept. 3rd, 1910, p. 713.

from atoxyl. *A*-atoxyl, as stated above, is the sodium salt of para-amidophenylarsenic acid, of which a formula is shown in Fig. 1:—

FIG. 1.

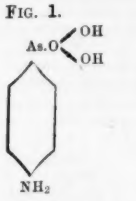


FIG. 2.

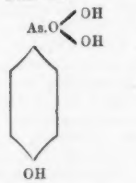


FIG. 3.

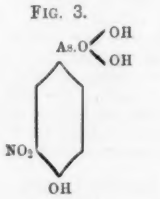


FIG. 4.

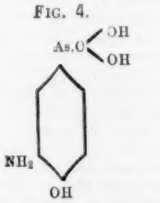


FIG. 5.

FIG. 6.

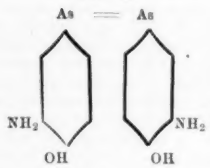
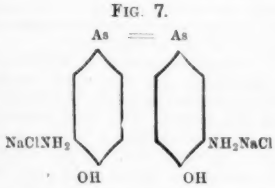


FIG. 7.



The amido radicle in Fig. 1 is replaced by a hydroxyl radicle by treatment with nitrous acid, which gives us para-oxyphenylarsenic acid (Fig. 2). By treating this new compound 2 with nitric acid, the nitro radicle is introduced into the meta position (Fig. 3). Reduction of compound 3 produces metaamidoparaoxyphenylarsenic acid (Fig. 4). Further reductions give us Fig. 5 and then Fig. 6—dioxydiamidoarsenobenzol, or "606." This compound being quite insoluble, a hydrochloride was prepared which is the yellow salt supplied by Professor Ehrlich. This on neutralisation with sodium hydrate gives us the sodium salt (Fig. 7). For commercial purposes "606" is prepared in a much simpler manner from arsenobenzol by the substitution of amido and hydroxyl radicles into the nucleus. It would appear that the activity of these substances depends upon the exact relationship of one radicle to another. Ehrlich considers that when there are two or more substitution molecules in the benzene ring one of which is capable (OH, or NH_2) of forming further combinations, the third radicle must be in the ortho position to the radicle capable of uniting with other compounds. In "606" the NH_2 radicle is in the ortho position to the OH radicle.

In the above compounds the amido radicle is perhaps of the greatest importance, for, as already stated, it was only after the discovery that in atoxyl the amido group was not bound up with the arsenic that these new and more efficient remedies were discovered. The fact that the arsenic is trivalent in "606" instead of being pentavalent as in the case of atoxyl is also believed to be an important factor in the efficacy of the remedy. Whether the amido radicle acts as the anchoring agent or as an auxiliary to the toxic influence of arsenic on the parasites is not quite clear, but it seems that the transposition of the amido radicle into the third position of the benzene nucleus has brought about a marked diminution in the organotropic properties of the medicament, without reducing in any way its parasitotropic qualities. In other words, these workers aimed at obtaining a remedy which approached as nearly as possible the most perfect therapy known—namely, serum therapy.

Chemotherapy has as yet been directed principally against micro-organisms of a protozoal origin, which the human body does not seem capable of destroying unaided. Recent researches have shown that Ehrlich's "*Therapia sterilisans magna*" is the most efficient method of dealing with such conditions. The introduction of this method of treatment was necessitated by his discovery that many organisms, chiefly of protozoal origin, had the power of becoming immune or resistant to injurious substances met with in the animal body. This fact explains the recurrence of trypanosomes and spirochætes in the blood of men and animals after apparent cures by a medicament. Relapses in infectious diseases can now be more intelligently explained by means of these facts.

The chronicity of protozoal and spirochæte infections is without doubt due to the same cause, as the parasites are able to protect themselves against each fresh output of antibody by the animal organism, till at last a condition of equilibrium is established between the two. In this state the chronic manifestations of the disease make their appearance. Nature for some reason does not seem able to upset this equilibrium until outside assistance has been given. In chemotherapy we have a means by which assistance can be given to the natural protective functions.

The manner in which a chemical compound such as dioxydiamidoarsenobenzol effects a destruction of the parasites in the organism is not a simple process. We know from the researches of Koch that the action is not of an antiseptic nature, as the ordinary antiseptics are as injurious to the host's tissues as to the parasites. A chemotherapeutic remedy must, therefore, possess a selective affinity for the parasite's protoplasm, in contra-distinction to that of the tissue cells. In order to explain this selective action Ehrlich has modified his side-chain theory of immunity to make it applicable to the study of chemotherapeutics. He terms the receptors in this case "chemoreceptors," the presence of such receptors in the protoplasm of the parasite being necessary before the remedy can fix itself thereto. When once the chemoreceptors of the parasite have been filled it is either so injured that it dies immediately or becomes an easy prey to the normal protective mechanism of the body. This hypothesis, then, of Ehrlich is really founded on the affinity of certain dye stuffs for certain tissues of the body. It is unlikely, however, that many chemotherapeutic remedies are sufficiently powerful to cause by themselves in every instance an immediate and complete sterilisation of the infected animal. Probably they destroy the majority of the parasites, and these destroyed parasites, being now in the condition of a soluble antigen, are the means by which a great increase of antibody is produced. The increased quantity of immune body may be sufficient to kill off any remaining parasites either by direct lysis or through phagocytosis. This probably occurs in the case of "606," as experiments on animals have shown that an elaboration of antibodies follows rapidly on the introduction of "606" into the infected organism, no matter at what stage of the disease the injection is made. In other cases the remedy has no direct lethal effect on the parasites, but nevertheless it injures them in such a way that certain of their vital functions are inhibited, as, for instance, reproduction, so that in a short time the parasites die out. It is also likely that some of these compounds so change the physico-chemical condition of the parasites' surroundings that the host's tissues and fluids are no longer suitable media for their continued existence.

Chemotherapeutic substances are usually grouped according to their manner of acting on the parasites as follows:—1. No action on certain parasites either *in vivo* or *in vitro*. In such cases either suitable chemoreceptors are absent from the protoplasm of the parasite or the receptors of the tissue cells of the host's organs have a greater affinity for the remedy than have the micro-organisms. In the latter condition the organotropic properties of the medicament are in excess of its parasitotropic qualities. 2. No action *in vitro*; marked action *in vivo*. A result which may be brought about in one of three ways: (*a*) by the remedy undergoing some change, in the body of the animals, by which it is converted into a parasiticidal substance; (*b*) by causing an

inhibition of some vital function of the parasite such as reproduction; or (*c*) by stimulating the natural mechanism by which the host rids itself of micro-organisms in conjunction with either of the two previous effects. 3. Action *in vivo* and action *in vitro*.

As previously pointed out, the difficulty of treating protozoal infections is due to the power which the parasites possess of causing relapses, these relapses or recurrences being due to the facility with which these parasites become immune or resistant to various toxic bodies, whether of an inorganic or organic origin. Ehrlich attributes the resistance of these "fast" strains to a shedding of their chemoreceptors or to a diminution or complete loss of all avidity on the part of these receptors. Whatever this acquired resistance may be due to, the remarkable fact has been demonstrated that this property is persistent in the strain for generations afterwards. Thus we are able to realise the intention of Ehrlich's *therapia sterilisans magna*, since by destroying the parasites at one blow, so to speak, the possibility of a resistant strain springing into existence is prevented. In many of the cases where a *therapia sterilisans magna* is employed an artificial crisis is produced. This crisis apparently resembles in every way that which occurs naturally at a later period of the infection.

Precautions to be Followed Before the Exhibition of "606."

In order to diminish the occurrence of any injurious effects Ehrlich advises that before an injection of "606" be given a careful examination of the patient be made. Special attention should be paid to the condition of such important organs as the heart, liver, and kidneys. If changes are found which are likely to interfere considerably with the functional activity of these organs it is advisable not to give "606." In the same way gross alterations in the nervous system are contra-indications. If, however, these lesions are most likely of syphilitic origin the danger accruing from the use of "606" is greatly lessened, though the more recent observations have shown that the use of "606" in those cases where the nervous system has been considerably involved even by the syphilitic virus is fraught with considerable danger to the patient.

Ehrlich also considers that it is necessary to ascertain previous to the injection whether the patient has an increased susceptibility to arsenic or not. In order to ascertain whether this condition of "allergie" exists, a test similar in detail to von Pirquet's tuberculin reaction is made except that a solution of arsenic is used instead of tuberculin. If the patient has any hypersusceptibility to arsenic an inflammatory reaction is said to occur at the site of the puncture. Recent results have indicated, however, that such a precaution is wholly unnecessary.

Dosage.

In the earlier cases Ehrlich advised a dose of 0·3 gramme; this quantity, however, was found to be insufficient. The amount usually given now for an average adult is 0·6 gramme; more may be given without ill effects, but at present larger single doses appear to be unnecessary.

Technique of Injection.

In our earlier cases the remedy was given by intramuscular injection into the buttocks according to Alt's formula. More recently we have also used a neutral suspension of the remedy subcutaneously, as advised by Michaelis and Wechselmann. We have had no experience of intravenous injections and think there is no necessity for the employment of such means, though Schreiber and others have described improved effects. The least painful of these methods is, of course, the intravenous injection. The pain caused by the neutral suspension is slight in comparison with that following the injection of the remedy as advised by Alt, but patients of apparently equal fortitude appear to experience very varying discomfort.

The site of inoculation is also worthy of consideration; our observations tend to show that subcutaneous injections in the scapular region are rather less painful and inconvenient than intramuscular injections in the gluteal region. But the fact that in some cases there is apt to be a more severe local reaction after subcutaneous injections, or even the formation of a sterile abscess, rather tends to counterbalance the advantages of this method. Local irritation, however, appears to be considerably diminished if care is taken to prevent any of the injection remaining in the puncture or its neighbourhood.

Alt's method of giving dioxydiamidoarsenobenzol consists of injecting a solution of "606" in caustic soda. The preparation given out by Professor Ehrlich in sealed and exhausted glass bulbs is a hydrochloride of dioxydiamidoarsenobenzol, and this acid salt must be neutralised before use. On the addition of sodium hydrate a precipitate falls which consists of the sodium salt of this hydrochloride of "606." This precipitate is soluble only in excess of sodium hydrate. The pain which follows an injection of this alkaline solution is to some extent caused by the excess of alkali in it. Alt advises that the required quantity of the remedy should be placed in a sterile test-tube and dissolved in 0·5 to 1·0 c.c. of the purest methyl alcohol (*pro analysi*). To this solution 10 c.c. of sterile saline solution are added, and then the whole is neutralised with a normal solution of sodium hydrate; a few more drops of sodium hydrate are added till the precipitate which has been formed is all dissolved. 20 per cent. acetic acid is now slowly added to remove excessive alkalinity until the solution is slightly opaque, and after it has been made up to 20 c.c. it is ready for injection, on the addition of some anæsthetic such as eucaine. Owing to the readiness with which the compound decomposes it is essential that it be used immediately or shortly after it has been prepared. We, however, find it better to dissolve the required amount of "606" in much less liquid than is advised by Alt. If a little care be exercised in making up the remedy it will be found to go completely into solution in as small a volume of fluid as 6 or 10 c.c. By this means the whole amount of "606" can be given in one injection, thereby saving the patient a lot of unnecessary pain. The higher concentration of salts in the solution does not cause an increase of pain. The injection ought to be made high up in the gluteal region, in a spot situated about the junction of the upper and middle third of a line drawn from the anterior superior iliac spine backwards to the top of the gluteal fissure.

The neutral suspension of Michaelis must also be made up just previous to use. The "606" is dissolved in 0·5 or 1 c.c. of methyl alcohol as before, and then about 10 c.c. of sterile saline are added. This acid solution is made neutral to litmus or phenolphthalein by the addition of a solution of normal sodium hydrate. If the neutral point is exceeded a small amount of acetic acid may be added. The dioxydiamidoarsenobenzol is present as a bulky yellow precipitate. The mixture is then centrifuged for a short time, and the clear supernatant fluid poured off. The precipitate is now emulsified in 100 c.c. of saline and injected subcutaneously or intramuscularly. In the above manipulations the strictest asepsis must be observed as the preparation cannot be sterilised.

If it is wished to give an intravenous injection the remedy is made up according to Alt's method, but the volume of liquid should be made up to 200 c.c., so that a clear solution is obtained which is also much less alkaline.

All our injections have been made by means of a "record" syringe with an ordinary steel needle, which, however, should be heavily plated. The neutral suspension necessitates use of a needle with a wide bore.

The patients were all kept in bed for a few days after the injection in case of any complication arising and for better observation. Their sera were examined for the Wassermann reaction before the injection was given, and at intervals afterwards; where possible a search was also made for spirochætes before and after the injection.

In the following short abstract we have thought it necessary to present *all* the cases of syphilis treated by us, and we have been careful not to over-estimate the beneficial influence of the drug. With two exceptions, these patients have been admitted into the London Hospital by Dr. J. H. Sequeira, and have been continuously observed by him both while in his beds and afterwards in his dermatological clinic. The cases, therefore, have been controlled by a very wide clinical experience.

CASE 1.—A female, aged 23 years, had a large chancre in the middle of the upper lip in process of healing with ulceration of its inner aspect. There were a general desquamating papular rash, an ulcerated throat, and enlargement of glands. The sore had been present for about four months and the rash for one month. On July 19th, 1910, the patient was inoculated in both glutæi with 0·3 gramme of "606" in solution. Three days later the chancre had healed, the recent spots had disappeared, while the older ones were fainter. After six days all spots had gone, leaving a pigmentation only. On the eighth day no glands were palpable, and on the tenth slight pigmentation of the rash only was observed. After three months the patient was in perfect health and had increased in weight 8 lb. No general reaction was

observed in this case. The local pain did not appear to us to be severe. On Oct. 20th the Wassermann reaction became slightly positive. On Nov. 3rd the patient returned with slight malaise, some four or five spots, two mucous patches, and slight sore throat. No spirochætes were found in the lesions. Wassermann reaction positive. On Nov. 15th she was given 0·6 gramme of "606" in solution intragluteally, which produced a rapid disappearance of the symptoms.

CASE 2.—A male, aged 30 years, had a hard chancre 1¼ inches long on the lower lip. The right submental and cervical glands were enlarged, but there was no other sign of syphilis. The patient was said to have been bitten on the lip in a fight. The sore had been present for three weeks. On August 16th, 1910, he was inoculated in both glutæi with 0·3 gramme of "606" in solution, and in two days the chancre was softer and the glands were smaller. Six days after the injection the glands were still enlarged, but the chancre was healing and much smaller. On the ninth day the unhealed area was three-quarters of an inch long. In five weeks the patient returned with the chancre no smaller and a very marked macular rash on the forearms. He was, therefore, again inoculated on Sept. 22nd with 0·6 gramme of "606." The chancre rapidly healed, leaving a slight induration; the rash faded. Two and a half months after the first inoculation he showed no signs of the disease. After the first inoculation the pain was very severe in both glutæi and in the knees and the calves, and it lasted for two days. There was, however, no general reaction; the second inoculation was comparatively painless. In this case the temperature rose to 99·2° F.

CASE 3.—The patient, aged 29 years, a male, was melancholic. He had a bad septic throat and suffered from earache. He had also a macular rash which was fading from the trunk and was marked on the buttocks. He had had a sore on the penis in October, 1909, without any rash. This latter did not appear until June, 1910, at which time also the sore throat and earache started. On August 13th his Wassermann reaction was completely positive, but on the 26th it was only partially so. At this latter date he was injected with 0·4 gramme of "606" in solution into both buttocks. On the next day the earache had gone. After three days his throat was quite clean and injected only, while after five days there was no longer any rash. However, after seven weeks, the throat was no better and the earache started on the other side. At the same time his Wassermann reaction again became completely positive and further treatment is intended. The pain at the time of inoculation was moderate only. There was no general disturbance.

CASE 4.—The patient, a female aged 19 years, had a small chancre in the middle of the upper lip and enlargement of glands. The chancre had been present for 10 weeks. On Sept. 9th, 1910, she was inoculated with 0·4 gramme of "606" in solution into both glutæi. In seven days the chancre was almost healed, and in 19 days it was completely healed. She has not been observed again. The pain was moderate and lasted for 24 hours. The highest temperature was 99·2° F., and the quickest pulse-rate 95.

CASE 5.—A male, aged 34 years. This man had a large suppurating sore on the left cheek with very marked general rash and glandular enlargement. He had been bitten on the cheek. The sore had been present for five weeks and the rash for 17 days. On Sept. 22nd, 1910, he was inoculated with 0·6 gramme of "606" in solution into both glutæi. In seven days the rash had nearly gone and there was very little discharge from the sore. After two weeks the sore was quite healed; the former rash was marked by a pigmentation only and the glands were still enlarged. He had gained 8 lb. in weight. After five weeks there were no signs of the disease. Following inoculation the pain in the small of the back was very severe for five days. For three days the temperature varied between 97° and 100° F., and during the same time the pulse ranged from 90 to 96. There was no other reaction.

CASE 6.—A female, aged 26 years, had a general macular rash. Her face was very badly affected and was desquamating. There was general enlargement of the glands. This rash had been present for six weeks. She was inoculated in the glutæi on Sept. 29th, 1910, with 0·5 gramme of "606" in solution. On the day after there was a marked Herxheimer reaction followed by a rapid diminution of the redness. After seven days there was little but pigmentation. On the fourteenth day there was still a slight mottling and the glands were enlarged. Five weeks after the inoculation the patient was quite well. The pain did not appear to be severe and there was no general reaction.

CASE 7.—A female, aged 26 years, with marked general papular and macular eruption. The throat was sore and the glands were enlarged. The rash had been present for about 10 days. She was inoculated on Sept. 29th, 1910, in both glutæi with 0·5 gramme of "606" in solution. In one day the former very marked rash on the hands and face was only visible on close inspection. The rash faded until on the seventh day there was little left; the sore-throat also had gone. After four weeks there was still a slight pigmentation in places. This patient did not complain of much pain and there was no general reaction.

CASE 8.—The patient was a male aged 26 years. He had a small penile chancre with no secondary symptoms. The chancre had been noticed for about three weeks. He was inoculated on Oct. 6th, 1910, in both scapular regions with 0·6 gramme of "606" in suspension. In one day the chancre was flatter and cleaner. On the fourth day it was clearly healing and on the fifteenth day had completely healed. No secondary symptoms have appeared. The local pain was mild. On the night of the inoculation the patient had a profuse sweat with a temperature of 101·4° F., a pulse rate of 100, and a respiration rate of 24. The urine was normal. After the first day there was no further disturbance.

CASE 9.—The patient, a male, had a widespread indurated ulceration of the whole lower lip, the chin, the left cheek, and half of the upper lip. This condition had lasted for nine months. For the past five years similar conditions had arisen on various parts of the body and usually had taken four months to heal with iodide of potassium. There was an indefinite history of syphilis and the Wassermann reaction was negative. The patient was inoculated on Oct. 6th, 1910, with 0·6 gramme of "606" in suspension in both scapular regions. In four days the ulceration was very much cleaner, but the inflammatory area was no smaller. In two weeks the area was much smaller and there was active epithelial proliferation. After three weeks the healing was still progressing and in one month was nearly complete. A considerable redness, however, still remains. Very little pain followed the inoculation. In this case also there was a profuse sweat during the first night with a temperature of 99·4° F. Otherwise there was no general disturbance.

CASE 10.—The patient, a male, aged 40 years, was under the care of Dr. Arthur Whitfield at King's College Hospital. He had a large scaling and infiltrating patch over the left forehead and including the left eyelid and a great part of the nose. There was a tendency to ulceration at one place only. The man had been infected 23 years before and had had a gummatous relapse 10 years ago. Dr. Whitfield first saw him in May, 1909, when he had a widespread condition of the left upper arm which had been diagnosed as psoriasis. This cleared up rapidly under mercurial inunctions and later pills. He discontinued treatment with the present result which has dated from the summer of this year. On Oct. 10th, 1910, he was inoculated with 0·6 gramme of "606" in suspension in both scapular regions. In 24 hours the lesion was paler and in four days it was almost flat though heavily pigmented. In ten days a large pustule occurred on the nose with an increase of redness. This healed in about four days. In three weeks the lesion was quite resolved, leaving some brown staining only. He increased 5 pounds in weight in the first week. The pain after inoculation was severe and there was a rise of temperature to 100° F.

CASE 11.—The patient, a male, aged 15 years, had congenital syphilis and a widespread inflammatory and ulcerative condition of the face, nose, and upper lip which had provisionally been diagnosed as lupus. The nose was depressed and obstructed by discharge. Double otitis media with affection of the internal ear was present, as well as otorrhœa. The hearing was very feeble on the right side and was absent on the left. There were interstitial keratitis and choroiditis on both sides. The patient was blind in the left eye, and on the right side there were very high myopia and dimness of vision. The condition had been progressing for four years. On Oct. 10th, 1910, he was inoculated with 0·1 gramme of "606" in suspension in the scapular region, and on the 12th with 0·2 gramme into the buttock. On this day (two days after the first inoculation) he spontaneously remarked that he could see better. On the third day the injection of the left eye and the opacity of the pupil were less. In five days there was very marked diminution in the size of the swollen lip. The inflammatory redness had gone from the face. The nasal discharge had ceased, permitting a cessation of the dressings. On the seventh day the patient could breathe freely through his nose. Ten days after the first inoculation he had a bad "cold," with foul aural discharge and increased redness of the lip. On the 25th he was again inoculated with 0·2 gramme of "606" in the shoulder and since then there has been a slow but persistent improvement in his condition. Both inoculations in the shoulders produced large red indurations but little pain. After the second inoculation the temperature rose to 99·4° F. and the pulse to 100; after the third the temperature was 100°.

CASE 12.—The patient, a male, aged 22 years, was under the care of Dr. J. Sangster Greig at West Ham Union Infirmary. He had a phagedenic chancre on the side of the prepuce 1½ inches long, associated with ulceration of the glans penis. There was a general papular rash, glandular enlargement, and sore-throat. The chancre had been present for two months and the rash one month. On Oct. 10th, 1910, he was inoculated with 0·6 gramme of "606" in solution into both glutæi. A slight Herxheimer reaction followed. In six days the rash was gone, the chancre half healed, and the glands practically normal. In 13 days a small area of the glans only was unhealed. In three weeks he was quite cured, and had increased 10 pounds in weight. The local pain was not severe, and the temperature rose to 99·6° F. only.

CASE 13.—The patient, a male, aged 25 years, had a healed chancre and a fading secondary rash all over, with much desquamation. The rash was marked on the face, neck, bend of elbows, &c. There were general glandular enlargement and gleet. The chancre appeared three or four months before and the rash six or eight weeks. On Oct. 12th, 1910, he was inoculated with 0·6 gramme of "606" in suspension into both shoulders. In three days the rash had nearly gone from the trunk and was fading from the face; in seven days the rash was hardly visible, while in 16 days all signs of disease had disappeared. He had very little pain and a temperature of 99·5° F.

CASE 14.—The patient, aged 28 years, was the mother of Case 15. There were no symptoms of syphilis. The Wassermann reaction was negative. Her children are healthy, the last being born four and a half years ago. There was a history of syphilis, she having had a rash which started two years ago and lasted until the time of conception of Case 15. She was inoculated on Oct. 14th, 1910, with 0·5 gramme of "606" in suspension in both shoulders. There was only slight pain. Just after inoculation she developed a severe "cold," with a temperature of 101·6° F. and malaise. This lasted three days.

CASE 15.—The patient was a male aged 4 weeks. He had pemphigus and a rash all over the body and nasal discharge. He had had six inunctions of mercury with benefit, but other spots were coming out. Dr. Sequeira thought that the child might live. The condition started four days after birth. The baby was not inoculated but was suckled by the mother. Three days after the mother's treatment the rash and pemphigus had nearly gone. In ten days the baby was quite well and is now thriving. No ill-effects were observed in the baby.

CASE 16.—The patient was a male aged 2 weeks. There were severe general bullous pemphigus and diarrhœa. The child had shed nearly all his skin. Dr. Sequeira thought that the baby would die. On Oct. 14th, 1910, he was inoculated with 0·02 gramme of "606" in suspension into the glutæus muscle. In three days the rash and pemphigus had practically gone. In four days there were a few spots only and no diarrhœa. Up to the seventeenth day the baby had been thriving; on this day he was again inoculated with 0·06 gramme of "606" in the shoulder. Local redness and swelling followed the first inoculation and seven days after a very small slough separated from the point of inoculation. There was no general disturbance. The second inoculation also has been followed by no ill-effects.

Disappearance of spirochætes.—The action of "606" on the Spirochæta pallida in the primary lesion is very rapid, as in Cases 2 and 8. No spirochætæ could be found in the primary lesion 24 hours after the remedy had been given, though just previous to the injection they were present in large numbers. The greatest destruction of spirochætes apparently took place 5 to 12 hours after the injection. No doubt those actually in the system are attacked at an earlier period.

Mercury, on the other hand, takes about three weeks to bring about this result. The above fact alone serves to stamp dioxydiamidoarsenobenzol as the greatest anti-syphilitic remedy we possess.

Leucocytosis.—In none of the above cases have we observed any such marked degree of leucocytosis as has been described by different writers.

Effect of "606" on the Wassermann Reaction.

Number of case and stage of disease.	Dose.	Before.	Weeks after—									
			2	3	4	5	6	7	8	9	10	12
Case 1. I. and II.	0·3	C	C	MO	—	—	—	—	O	—	—	O
Case 2. I.	0·3 } 0·6 }	C	M	O	—	—	O	O	—	—	O	—
Case 3. II.	0·4	CS	—	—	—	—	—	S	—	C	—	—
Case 4. I.	0·4	C	—	S	—	—	—	—	—	—	—	—
Case 5. I. and II.	0·6	C	C	C	—	C	—	—	—	M	—	—
Case 6. II.	0·5	C	C	C	C	C	—	M	—	O	—	—
Case 7. II.	0·5	C	C	—	C	—	—	—	C	—	—	—
Case 8. I.	0·6	C	M	O	O	O	—	—	—	—	—	—
Case 9. III.	0·3	O	O	O	—	O	O	O	—	—	—	—
Case 10. III.	0·6	C	C	C	—	—	C	—	—	—	—	—
Case 11. Congenital.	0·1 } 0·2 } 0·2 }	C	C	—	C	C	—	C	C	—	—	—
Case 12. I. and II.	0·6	C	M	S	—	—	O	O	—	—	—	—
Case 13. II.	0·6	C	C	—	C	—	C	C	—	—	—	—
Case 14. Latent.	0·5	O	O	—	O	O	—	—	—	—	—	—
Case 16. Congenital.	0·02 } 0·06 }	—	—	—	—	—	—	—	—	—	—	—

C=Completely positive reaction. M=Medium positive reaction.
S=Slightly positive reaction. O=Negative reaction.

We do not suppose that "606" can directly influence the Wassermann reaction, but by its destruction of the spirochæte it removes the cause. At any rate, the rapidity with which in some cases the patient's serum loses the power of giving a positive Wassermann reaction is one of the greatest arguments in favour of Ehrlich's new specific. In our own cases, as can be seen in the above table, the earliest period at which the reaction has disappeared after an injection is three weeks (Cases 1, 2, and 8). It will be seen that two of these cases were in the first stage of the disease. The reaction disappears much more slowly in cases of secondary syphilis, and, in fact, has already persisted in some of our cases for seven weeks. These results are not surprising, as in primary syphilis the Wassermann reaction is usually a weak one, though completely positive. There is in these cases little or no excess of reacting substances in the serum. In secondary syphilis, however, there is a much larger quantity of the Wassermann-producing substances in the serum, and it is only logical to expect that they will take a longer time to disappear. We are convinced that the information supplied by the Wassermann test is an essential indicator of the patient's progress. If the reaction fails to become negative after an interval of several weeks, it is to be suspected that the patient is not doing so well as he should, and in all probability will have a relapse, as was the case with patient No. 3.

Effects on Lesions.

In the case of primary lesions, genital or extragenital, the process of repair is very rapid. In contradistinction to the five or six weeks required for the disappearance of a chancre under ordinary treatment, only from 10 to 14 days were required for complete healing. Secondary lesions, as a rule, show an improvement within 24 hours of an injection of "606." In the case of the secondary eruption, however, the pigment appears to persist for a long time; this persistence of the pigment is no doubt only relative, as after an injection of "606" the absorption of the inflammatory lesion is no longer a gradual process as when mercury is used, but an immediate one. In tertiary lesions the effects are much more varied. Some disappear as if under a magic influence; others, again, show little or no alteration for some days after the injection. In congenital syphilis even of the worst types the rashes disappear in two or three days. Lesions of a more chronic nature, such as interstitial keratitis, resolve very much more slowly.

Question of Temperature Response to "606."

The alteration in temperature after an injection of "606" in cases of primary and secondary syphilis is comparable to what occurs in certain acute infections which terminate by crisis. In other words "606," owing to the rapidity with which it sterilises the human organism of spirochætes, produces a cure in these stages by a definite crisis. The patient's temperature rises as a rule one or two degrees (100° or 101° F.) within 12 hours, after which it falls almost as suddenly as it rose. The patient at the same time experiences a profuse sweat. If the temperature is high at the time of inoculation it usually falls to normal about 24 hours later. This temperature response is not observed in the majority of patients suffering from latent or tertiary syphilis. No doubt the flooding of the system with an excess of soluble spirochæte products is the actual cause of these phenomena.

Relapses.

In Cases 2 and 3[1] it will be noticed that relapses occurred, but not relapses in the sense of a clinical recurrence after a clinical cure. Neither of these patients had cleared up after one inoculation, which, it must be observed, was in each instance small. These accidents, to a large extent, must depend upon the *size* and *spacing* of the doses. The question arises as to whether one dose on the average is sufficient to produce complete sterilisation of the body, however large it may be. We take it that "606" is intended to have a lethal influence on spirochætes, but that all the spirochætes in the body are not destroyed by this influence. The residuum, great or small, is overcome by the antibodies to "endotoxins" liberated from those spirochætes destroyed by the "606." Thus if there are few spirochætes in the body, there will be a small output of antibody, perhaps insufficient to finish the cure or at least liable to delay it. Such a state may be present when the Wassermann reaction is negative or feeble. This is held to imply the presence of a small quantity of the virus in the body. It is also known that arsenic circulates in the system for a very short time after injection: it is very rapidly "fixed" by the tissues, especially the kidney. What, then, is to be expected in cases such as Nos. 3 and 9 with feeble and negative Wassermann reactions? The arsenic which is absorbed destroys, indeed, some spirochætes, but most is "fixed" by the tissues and lost. The production of "endotoxin" and subsequent antibody is small. Sterilisation in the one case was incomplete; in the other recovery was at least slow, and will probably also be incomplete. In cases of this sort, therefore, as also in cases of primary syphilis, if not in syphilis of any variety, we think that more than one dose will be found to be more certain in action. Ehrlich recommends an initial large dose given intravenously, or if there is thought to be objection to this, intramuscularly, in solution. This ensures a rapid absorption and a sharp *ictus immunisatorius*, leading to a maximum destruction of spirochætes and production of antibody. Then, since the first injection will be rapidly wasted, on the second or third day, a second dose in suspension should be given to act as a "depôt" over a considerable time. All our recent cases have been treated on this principle. The patient is first given an injection of 0·5 to 0·6 gramme "606" in alkaline solution intramuscularly in the gluteal region, the volume of liquid injected not being more than 10 c.c. Three days later he is given 0·4 gramme "606" neutral suspension intramuscularly in the opposite side.

The employment of "606" will probably assist in the elucidation of several points of interest in the immunity to syphilis. Among these are the changes which occur in the serum components of patients who have been treated with "606." That the Wassermann reaction should rapidly become

[1] Since this paper went to press Case 1 (*q.v.*) also relapsed, after an apparent cure lasting nearly four months.

negative is not to be wondered at in view of the potency of the drug. We provisionally consider this reaction to be due to the presence of abnormal compounds in the blood, such compounds being the direct result of a destructive action by the living syphilitic virus on the tissues. If the virus is destroyed these compounds will no longer be formed, and those already present will be excreted in a few weeks or less according to the quantity originally present. The antibody which is formed by the presence of "endotoxins" is presumably a specific antibody and quite distinct from the Wassermann body, which is thought to be a direct degeneration product. If the latter were an antibody it could not be diminished by specific treatment. This has been demonstrated in experimental trypanosomiasis, where both specific antibody to the trypanosome and the Wassermann body are capable of being separately demonstrated.

Some writers have stated that a negative Wassermann reaction may become positive after inoculation. They assume that the soluble products, "endotoxins" of the spirochætes, are capable of bringing about that tissue degeneration which results in the Wassermann reaction. In the case of a negative reaction such products would be too few to detect, but as a result of inoculation a maximum output of "endotoxin" from the destroyed organisms suffices to produce the necessary tissue degeneration and a positive reaction. In three of our cases in which the reaction was negative or slight before inoculation no increase was observed. Any change has always been in the opposite direction. Many recent writers, moreover, have also failed to observe any such change, and as we are at present of opinion that in acute syphilis the Wassermann reaction is due to the active intervention of living spirochætes we are not surprised that these occurrences are rare.

In the literature there are already on record a few cases where the injection of "606" into the mother of a congenitally syphilitic baby resulted in a rapid and complete cure of that baby through the agency of the mother's milk. Such cases are explicable in two ways: first, that the injection of the mother with a positive Wassermann reaction by destroying a number of spirochætes produces in her a large amount of antibody, and that this antibody secreted in the milk brings about the recovery of the child; and secondly, that there is a direct transference of "606" by the milk. Ehrlich favours the former view, since in the cases published it was stated that no arsenic was found in the milk, or in a quantity insufficient to explain the therapeutic result. If this be the case it is difficult to explain our case No. 14. This woman had a negative reaction but a recent history of syphilis. In these circumstances she could not have produced sufficient antibodies as the result of a destruction of spirochætes. It is therefore possible that the "606," merely by stimulation of the cells which previously had produced syphilitic antibody, caused a sufficient amount of these bodies to appear in the milk. It is, however, also possible that on the application of more refined methods arsenic may be demonstrable in the milk in larger quantities, and may take a more direct part in the cure than has been supposed.

This stimulating property of "606" may account for the great rapidity with which these antibodies are elaborated. The onset appears to be very much sooner than is the case in other immunising processes and cannot be altogether due to the large amount of antigen in the circulation as a result of the inoculation. That "606" has a stimulating effect on many metabolic processes can hardly be doubted. The subjective sensations of the patients are greatly improved, and where weight has been lost it is rapidly regained; for instance, Case 2 gained 7 pounds in 10 days, while Case 12 gained 10 pounds in 18 days. Further, inflammatory conditions subside, and a case of myelogenous leukæmia with 240,000 white cells per c.mm. before inoculation by us, one week afterwards had only 120,000. Such conditions as dropsy, œdema, and jaundice in one moribund non-syphilitic individual disappeared after inoculation, even though the causative malignant disease killed the patient in a few days.

Certain phenomena noticed from time to time while using "606" in syphilitic cases can only be explained on the assumption of endotoxins liberated from the spirochætæ. It has been shown that very young congenitally syphilitic infants are unsuitable for treatment except with very small doses, and the fatal results are explained by the very large quantity of endotoxins which must be produced from the innumerable spirochætes present in such cases. Again, we have observed the Herxheimer reaction in two cases. This reaction appears to be considered to be due to an *insufficient* dosage. It is suggested that the spirochætes are not sufficiently rapidly destroyed, that they have time to react to the noxious influence of "606" with an increased production of poisons. In our cases, however, the dose was not particularly small. We are at present inclined to look upon this phenomenon as being of the nature of an anaphylactic manifestation in an individual particularly sensitive to the syphilitic "endotoxins": a phenomenon comparable to those following the introduction of tuberculin or any other antigen into an already sensitised subject. These reactions have been particularly mentioned by Ehrlich as a cause of dangerous symptoms or death in the case of general paralysis and similar conditions. If in such a case of nervous degeneration a reaction occurs in an essential nerve, such as the vagus, the *exitus lethalis* will probably follow, and such an event, if these cases be operated upon, must be guarded against by the exhibition of *very small* doses.

The importance of "606" as a destroyer of spirochætes cannot be over-estimated, even apart from the beneficial effect upon the patient. In those cases in which spirochætes were demonstrable in very large numbers before inoculation, none were found in less than 24 hours, even after prolonged search. This fact has already been fully established. The importance of the observation lies in the probability that cases of syphilis can be rendered practically non-infective in a day or two. If this be true, Ehrlich will have swept away the scourge of 2000 years and given into the hands of any State, which will avail itself of it, a weapon for the forcible suppression of syphilis.

NEW CHEMICAL LABORATORIES AT UNIVERSITY COLLEGE, LONDON.—On two previous occasions we have called attention to an appeal for £70,000 for the purpose of providing University College, London, with new chemical laboratories. We have now received a letter from Prince Arthur of Connaught, President of the appeal committee, stating that it is a matter of particular urgency that the sum of £25,000 should be raised before Christmas Day in order that the Senate of the University may exercise the option to purchase the Gower-place site. Towards this sum over £10,000 have now been raised. Donations sent to His Royal Highness, addressed to University College, London, will be acknowledged by him.

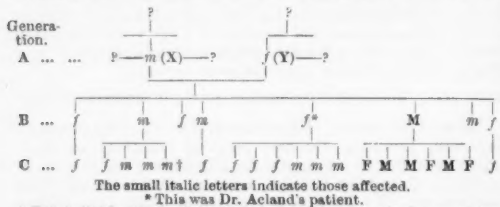
FOOD CONGRESS.—The Deuxième Congrès de l'Alimentation will take place in Liége from Oct. 1st to 4th, 1911. This Congress has been organised in order to continue the work, as far as Belgium is concerned, of the Congress which was held at Paris in 1909 organised by the Société de la Croix Blanche de Genève and the Food and Hygiene Congress which was recently held at Brussels, organised by the Belgian Government. Foreign specialists are invited to take part—viz., physiologists, chemists, bacteriologists, hygienists, jurists, producers, merchants, &c., in order that they may examine the whole question of food and discuss the measures to be taken to reconcile the requirements of hygiene and public health with commercial interests. The labours of the Congress will chiefly relate to the following food products—viz., milk, cheese, meats, poultry, fish, eggs, pickles, fats, bakery products, pastry, confectionery, chocolate, preserved vegetables, fruits, mushrooms, sugars, syrups, glucose, jams, tinned provisions, spices and condiments, waters, lemonades, ice, beers, wines, ciders, alcoholic drinks, vinegars, liqueurs, fruit juices, syrups, &c. The president of the congress is Professor M. A. Jorissen, of the University of Liége, and an official of the Permanent Belgian Commission of Human Alimentation. The vice-presidents are: M. Julien Delaite, M. de Molinari, M. J. Raymond, M. L. Rutten, M. E. Sohier-Beaujean, and M. J. Van Zuylen. The secretary-general is Dr. F. Schoofs, secretary-general of the Permanent Belgian Commission of Human Alimentation. The treasurer is M. E. Halleux, barrister and secretary of the Union of Purveyors. All communications should be addressed to the secretary at Rue des Guillemins, 27, Liége, Belgium. The subscription is fixed at 10 francs. The title of "*Membres donateurs*" will be given to those who subscribe at least 50 francs, and the title of "*Membres protecteurs*" to those who subscribe at least 200 francs. The family of regular members may become *membres associés* at 5 francs per person and will be invited to the fêtes.

A PEDIGREE SHOWING BI-PARENTAL INHERITANCE OF WEBBED TOES.

BY H. P. NEWSHOLME, M.B. OXON., M.R.C.P. LOND., B.SC. LOND.

IT is of rare occurrence to find a family in which the same abnormality has been inherited from both parents. Dr. E. Stainer, in a very interesting paper,[1] has collected from the literature six pedigrees of this nature, among which is included the one shortly to be discussed. These appear to be the only instances recorded.

The family now in question was brought under notice through a patient admitted to St. Thomas's Hospital in June, 1910, under Dr. T. Dyke Acland, who has very kindly allowed me to publish the facts. The patient, a woman aged 45 years, was admitted to hospital on account of visceroptosis, severe Dietl's crises, and glycosuria. It was discovered accidentally, during a routine examination, that the second and third toes of each foot were webbed as far as their terminal phalanges. Further inquiry showed that this deformity occurred through three generations and involved 22 members of a family of 29, as indicated in the accompanying pedigree. Other members of Generation A, as well as



The small italic letters indicate those affected.
* This was Dr. Acland's patient.
† This individual had webbing of the third and fourth fingers of the right hand, but no webbing of the toes.

one or other parent of both X and Y, were probably affected, but no precise information on these points could be obtained. All the marriages occurring in generation B were with normal persons.

Owing to the rarity of such pedigrees, it seems important to mention the sources of information and the evidence of its reliability. 1. Nearly all the facts were given by the patient herself (No. 5, Generation B). The patient was a quiet, inexcitable, sensible woman, not at all inclined to exaggerate or to romance. She showed no sign of hysteria or of a morbid desire for sympathy or attention. She had, moreover, no motive for endowing other members of the family with a deformity of which she herself was oddly ashamed. 2. These facts were corroborated, and others added, by a brother (No. 6, Generation B); also by a sister (No. 3, Generation B), who is attending the out-patient department of St. Thomas's Hospital for diabetes. The brother (No. 6) is quite positive that he and his children are the only members of this branch of the family free from webbing. 3. The presence of webbing was verified in the patient and in one of her children, the only members of the family who could conveniently be examined. 4. The informants mentioned above believe, but cannot be quite certain, that the webbing has nearly always involved the second and third toes of each foot. A notable exception will be seen in a note to the pedigree. 5. The fact that *both* parents (X and Y) had similar webbing has been impressed on the family by a dramatic incident, the memory of which is now evidently a precious family possession. The presence of webbing in both parents was not recognised till the birth of their first child, when each parent claimed its webbed toes as his or her particular contribution. Naturally an unveiling of parental toes followed, and resulted in mutual surprise, mutual satisfaction, and the amusement of younger generations. 6. Both X and Y are said to have had several brothers and sisters with webbed toes, and are believed themselves to have inherited the deformity from their parents. This information was so lacking in precision that I have been unable to include these members in the table. From X and Y onwards, however, the facts are clear and complete.

The only question to be considered here concerns the extent to which this pedigree conforms with Mendelian principles. Mendelism aims at attacking problems of heredity by dissecting the individual's almost innumerable traits into as many pairs of opposed characters as it can. To choose instances at random, it might take pairs such as the following: long hair, short hair; fair hair, dark hair; tallness, shortness, &c.; and by working out the transmission of each pair get finally, more or less completely, the inheritance of the individual. Since physical are far more easily measured than mental characters, Mendelism necessarily limits itself almost entirely to the former. In the case in question, "webbing" and "no webbing" must be the two opposed factors. The character "webbing" is, of course, the one which renders this family peculiar, while the character "no webbing" it shares with the rest of mankind.

Of the two gametes, spermatozoon and ovum, which unite to develop into any of the individuals in this family, both may contain or both may be free from the subtle property which gives rise to webbing, so that the individual into whom they develop is either saturated with or quite free from the conditions which give rise to webbing. But there is another alternative: one gamete may carry the factor "webbing," while the other may not. (The second may conveniently, though not accurately, be described as carrying the factor "no webbing," which is, strictly speaking, not a factor but the absence of a factor.) In such a case the individual resulting from their union will, so far as this character is concerned, be a hybrid or *heterozygote*. The germ-cells which he or she bears will not all be exactly the same in properties. All will be spermatozoa or all will be ova, but they will bear the impress of the gametes from which they are descended in that some will contain the factor "webbing" and others the factor "no webbing." Moreover, those gametes carrying one factor will equal in number those carrying the other factor. The whole structure of Mendelism stands on this one principle, that the germ-cells of a heterozygote can be divided into two equal groups, those in one group containing one factor and those in the other its opposite.

Further, given an individual resulting from the fusion of two gametes, one carrying the factor "webbing," the other the factor "no webbing," he will be webbed or not webbed according as webbing is or is not stronger than, or *dominant* to, absence of webbing. The weaker factor here becomes latent or *recessive*.

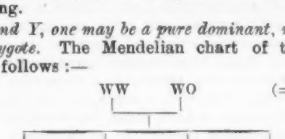
In considering each individual it will be convenient to have signs for the two classes of gametes. Thus that group of gametes which contains the character "webbing" may be represented by W, and the group containing the character "no webbing" by O. A heterozygote, then, will be indicated by WO; and, according as we find on trial "webbing" or "no webbing" to be a dominant factor, so a pure dominant and a pure recessive will be represented by WW and OO, or *vice versâ*.

Now dealing with the family more particularly the following possibilities arise with regard to X and Y:—

1. *Webbing may be a recessive character*, so that it will lie latent unless both individuals are pure recessives, developed from gametes containing only the character "webbing" and themselves bearing gametes containing only the same factor. Since X and Y are known to have been webbed they must on the above hypothesis have been pure recessives. In that case, since neither contains the group of gametes O the children resulting from their intermarriage would necessarily all be pure recessives, and would hence all be webbed. But generation B contains one unwebbed member. Webbing cannot then be recessive. We must therefore conclude that *webbing is a dominant character*.

2. *Both X and Y may be pure dominants.* Then, as neither parent would bear the recessive group of gametes O none of their children could be free from webbing. But, as has been seen, one member of generation B is not webbed. The assumption, therefore, that both parents are pure dominants must be wrong.

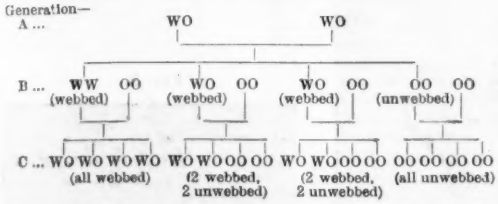
3. *Of X and Y, one may be a pure dominant, while the other is a heterozygote.* The Mendelian chart of their progeny would be as follows:—



[1] The Hereditary Transmission of Defects in Man (Oxford University Press).

Since webbing is dominant all the offspring would be webbed, although only half of them are pure dominants. Since one member of generation B is unwebbed, the hypothesis that of X and Y one is pure dominant and the other a heterozygote must be wrong.

It must be concluded, then, that (*a*) *webbing is dominant, and* (*b*) *both X and Y are heterozygotes*, each derived from gametes of opposite qualities as regards webbing, and each bearing both groups of gametes W and O, and bearing them in equal numbers, each, therefore, being represented by the sign WO. On Mendelian principles the offspring of the marriage of two heterozygotes would be as follows, the children of the first marriage marrying in their turn, but marrying normal individuals, OO:—


Generation—
A ... WO WO
B ... WW (webbed) OO WO (webbed) OO WO (webbed) OO OO (unwebbed) OO
C ... WO WO WO WO (all webbed) WO WO OO OO (2 webbed, 2 unwebbed) WO WO OO OO (2 webbed, 2 unwebbed) OO OO OO OO (all unwebbed)

For convenience of reference these have been lettered in Generations A, B, C, to facilitate comparison with the pedigree under consideration. The results of comparison may be tabulated as follows:—

	Mendelian result.	Actual pedigree.
Generation B	1 unwebbed in 4	1 unwebbed in 8
Generation C	8 ,, ,, 16	6 ,, ,, 19

As they stand, the variance between the two sets of figures is so great as to suggest that the observed facts run counter to the Mendelian theory. But the error inherent in small numbers must always be borne in mind. The accident of one child more or less in each generation would have affected the proportions very materially.

The extent of this error can be estimated by means of Poisson's formula, in which the limits of error per unit are $\pm 2\frac{\sqrt{2mn}}{\mu^3}$, where μ = total number of cases recorded and m = number in one group and n = number in the other group. Here for generation B, $\mu = 8$, $m = 7$, $n = 1$; while for generation C, $\mu = 19$, $m = 13$, $n = 6$. Substitution of these values gives the following results:—

Generation B. Limits of error for unity = approx. $\pm 0{\cdot}33$,
,, ,, 8 cases = $\pm 2{\cdot}6$.

Thus, allowing for this possible error of 2·6 in 8, dependent on the small data available, the pedigree might conceivably have shown, instead of 1 unwebbed in 8, any proportion between 3·6 in 8 and 0 in 8. The Mendelian ratio of 1 in 4 (2 in 8) obviously lies within these extremes.

Generation C. Limits of error for unity = approx. $\pm 0{\cdot}33$.
,, ,, 19 cases = $\pm 6{\cdot}3$.

Here, where the actual ratio was 6 unwebbed in 19, the extreme limits of variability are from 12·3 in 19 to 0 in 19. The Mendelian value of 8 unwebbed in 16 (9 in 19) lies within these extremes. In both cases, therefore, the Mendelian value is seen to be not incompatible with the actual data obtained.

These considerations show only that the pedigree in question neither supports nor throws doubt on the Mendelian hypothesis. It is like all similar small pedigrees, quite neutral in the argument which it provides. This must necessarily be the weak point in all family pedigrees where the members can be numbered only in tens instead of in hundreds. Obviously deductions must be made very cautiously, if at all, where the possible error in either direction reaches, as in this instance, 30 per cent. of the number of cases observed. For the same reason it is dangerous to conclude, on the grounds that one large fraternity in Generation C is seen to be webbed throughout and another to be quite free from webbing, that therefore the one indicates a pure dominant, the other a pure recessive strain.

This family is interesting also in connexion with a defect in sugar metabolism, which occurred in three members of the family (Nos. 2, 3, and 5, Generation B). The patient herself has mild glycosuria; an elder brother died from diabetes and pulmonary tuberculosis, and one sister is being treated in the out-patient department of St. Thomas's Hospital for diabetes. No further facts bearing on this point could be obtained with regard to other members of the family.

NOTE ON AN OBSCURE CASE OF PERITONITIS.

BY R. H. NORMAN, M.D. LOND.

THE following case seems worth reporting.

A male, aged 33 years, was seen by me on Nov. 12th last. He complained of severe continuous pain in the epigastrium, both hypochondria, and the right iliac region. There was no point of special tenderness. He had vomited several times that day, the vomit being gastric only. The abdomen was distended and moved with respiration. Nothing abnormal could be felt. The temperature was 102° F. The bowels were constipated. On the next day he was in much the same condition, the pain being a little less after some small doses of opium. The temperature at 9 P.M. was 104°. The bowels had been opened by enema, and subsequently two loose, bright yellow motions were passed. The colour of the motions suggested enteric fever, but no other symptom pointed to that diagnosis. He had been ailing a week or ten days, feeling languid and having a poor appetite, but he kept at his business until the morning of the 12th. I took a specimen of his blood and sent it to the Jenner Institute, and a positive Widal reaction was reported. On the 14th the temperature at 10 A.M. was 102°, and at 9.30 P.M. 104°. The abdominal pain was still severe, especially in the epigastrium and the left hypochondrium. On the morning of Nov. 15th I found him much worse, with a running, rapid pulse of 120–130, and temperature 102°. The abdomen was much distended, with little or no movement in respiration, general tenderness, but no rigidity. I suspected perforative peritonitis, but could not satisfy myself that this was so, the liver dulness being normal. He was carefully removed to the North-Eastern Hospital. The grave abdominal condition pointed to the immediate need of a coeliotomy as the only chance of saving him. This was done, but the patient never rallied.

A post-mortem examination was made, and Dr. Frederic H. Thomson has very kindly supplied me with the following notes: "A mass of inflamed tissue was found behind the stomach in which were several broken-down caseous glands. There was a cavity in this mass, and from it one sinus led into the stomach. The ulcer in the stomach was not a recent one. Another sinus led to a caseous mesenteric gland, and two others led into the peritoneum. The openings into the peritoneum were apparently recent. There were a number of caseous mesenteric glands, and acute peritonitis was present. The right lung was bound down by old adhesions. There was no evidence of enteric fever." Fourteen or fifteen years ago tubercular glands were removed from his neck.

Canonbury Park South, N.

UTERINE CERVICAL POLYPUS UNDERGOING MALIGNANT DEGENERATION.[1]

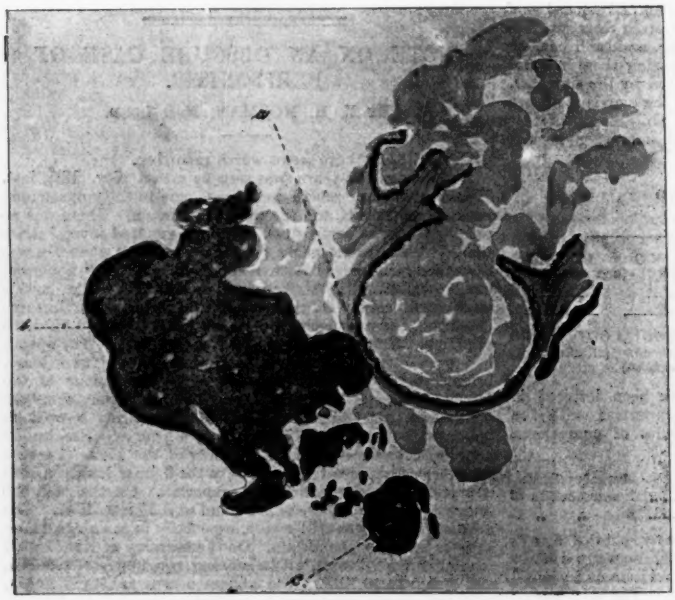
BY H. MACNAUGHTON-JONES, M.D., M.CH., M.A.O. Q.U.I., F.R.C.S. IREL. & EDIN.,
PRESIDENT OF THE OBSTETRICAL AND GYNÆCOLOGICAL SECTION OF THE ROYAL SOCIETY OF MEDICINE.

DURING the last session Mr. J. H. Targett exhibited an adeno-fibromatous polypus of the uterus in which there were undoubted evidences of malignancy. At the time I obtained from Professor Schottlaender microscopical drawings of the sections of a cervical polypus removed when I was at Heidelberg in the late Professor Rosthorn's clinique. I have the privilege of showing these for Professor Schottlaender (Case 1, Figs. 1–4). Such an occurrence is so rare that I feel justified in placing his case on record.

CASE 2. *Carcinomatous polypus of the fundus uteri—the cervix alone being carcinomatous.*—I also show for Professor

[1] A paper read before the Obstetrical and Gynæcological Section of the Royal Society of Medicine on Oct. 6th, 1910.

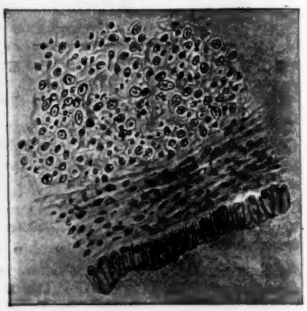
FIG. 1.



Case 1.—General view of the polypus; low magnification. (*a*) (*b*) (*c*) Sections taken at the points indicated in this drawing.

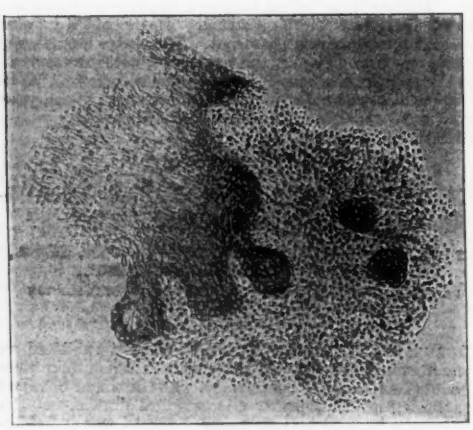
The drawings show (*a*) a cervical gland in its periphery becoming sarcomatous; (*b*) the surface of the polypi covered with a layer of proliferating, metaplastic cylindrical epithelium; (*c*) an island of cervix mucosa with many-layered glandular epithelium filling the gland lumen (arousing the suspicion of early carcinoma) surrounded by a sarcomatous stroma. The patient was aged 70 years; she would not submit to any further operation.

FIG. 2.



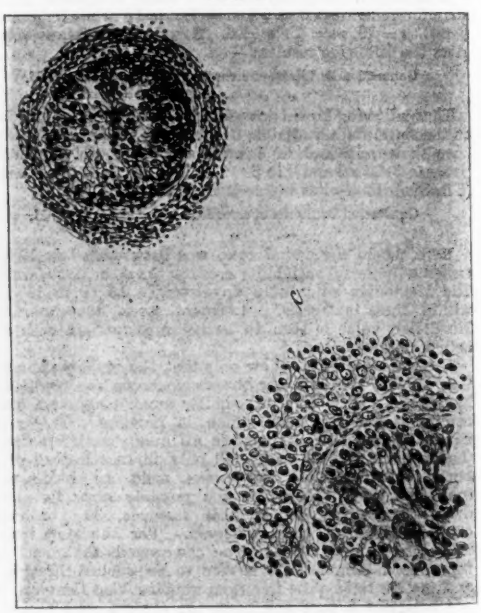
Case 1 (*a*).—Taken through the periphery of a cervical gland surrounded by a cellular stroma becoming sarcomatous.

FIG. 3.



Case 1 (*b*).—Taken from the surface of the polypus. On the surface is a layer of metaplastic cylindrical epithelium, which proliferates inwards. Several detached single alveoli appear separated from the main mass.

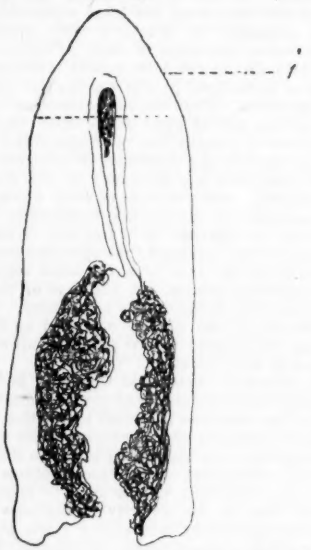
FIG. 4.



Case 1 (*c*).—An island of cervix mucosa with many-layered glandular epithelium filling the gland lumen and arousing the suspicion of early carcinoma surrounded by a sarcomatous stroma.

Schottlaender a drawing of the sagittal section of an entire uterus, the cervix of which was destroyed by a carcinomatous crater, and in the fundus, growing from its summit, a mucous polypus. Section of the latter showed a solid carcinoma. There was no connexion whatever between the polypus and the carcinoma of the cervix, the mucosa of the fundus and body being quite free from carcinoma. The patient was a woman aged 57 years.

FIG. 5.



Case 2.—The cervix shows a carcinomatous crater for which a radical operation has been carried out. A small mucous polypus is seen at the fundus, and sections have been made through the fundus at the level of the dotted line. The sections have not passed through the level of attachment of the polypus, which therefore seems to lie free in the uterine cavity. The polypus is seen to be invaded by strands of columnar-celled epithelium, some of which are solid and others alveolated. The endometrium of the corpus is atrophic; most of the gland epithelium has disappeared or dropped out of the lumina of the glands during preparation.

In connexion with this case I may refer to one brought before the British Gynæcological Society by me—in which a carcinomatous mass filled the summit of the uterus, the rest of the cavity and the cervix being free from malignancy.

Harley-street, W.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTE ON CO POISONING AT THE WHITEHAVEN PIT DISASTER.

BY C. J. J. HARRIS, M.D. DURH.,
AND
EUSTACE THORP, L.R.C.S. EDIN.

ON May 11th, 1910, there occurred in the Wellington Pit, Whitehaven, a disaster by which 136 men and boys lost their lives. Five months afterwards we examined a large number of the bodies. The greater number were much decomposed. From each batch specimens of liver and heart were sent to a physiologist for examination, with the result that the spectroscope proved that in 35 death was undoubtedly due to CO poisoning. This, we think, is a record for the length of time for detection of CO-hæmoglobin. In the case of many other bodies in which we suspected death to have been due to CO, but in which it was not proved, it was supposed that the compound had been dissociated by heat and bacterial agency. The heat was so intense at certain parts of the mine that iron bolts were melted. On examining the bodies post mortem we noticed that all were well nourished. The viscera showed great decomposition. The liver in all cases was in a state of excellent preservation, the heart in fairly good condition though flabby, and the lungs were the most decomposed organs. The muscles and intestines were of a bright pink colour, which quickly turned muddy-brown on exposure to air. Certain of the bodies showed signs of burning, extensive charring being present on all parts, the scalp in some instances being entirely carbonised. In one case a mass of bones and white ash were found: these were quite calcined and resembled the shanks of clay pipes, the only perfect bones being the temporals, some carpal and metacarpals, and one or two vertebræ. The remains were found in most cases in attitudes of repose and in large groups, and in many instances so decomposed that one of us (C. J. J. H.) found it necessary to order the bearing party to place shovels under the head, shoulders, hips, and legs to prevent them from falling apart. From our investigations the causes of death were classified thus:—

Undoubted CO poisoning	35
Burns and shock	30
Violence of explosion	12
Suffocation (smoke fumes and probably CO) ...	38
Burns and suffocation (not CO)	4
Presumably burns, shock, and suffocation ...	1
Suffocation (probably CO)	12

Thus we believe that 85 of the victims met their death from CO poisoning and, as mentioned above, in 35 this was definitely proved. It may be interesting to add that the remains were found about 600 feet down, the nearest being three miles from the shaft. Falls and gas had to be encountered, so that the men had to move the bodies as expeditiously as possible, many of them being "groggy" on their legs from the inhalation of the gaseous fumes. Formaldehyde was the disinfectant used.

Whitehaven.

NOTE ON A CASE OF LOSS OF VISION FOLLOWING A SMALL DOSE OF SANTONIN.

BY E. J. BAXTER, L.R.C.P. & S. E.

THE following sad case of poisoning by half a grain of santonin may be of sufficient importance to make it worthy of notice in your valuable journal.

A girl, about 5 years of age, suffering from roundworms and threadworms, was brought here for treatment. My assistant gave her a dose of santonin in castor oil, which, however, her mother says, she vomited almost immediately after leaving the dispensary. Three days later she brought the child again for treatment, as beyond the vomiting caused by the castor oil the first dose had had apparently no effect. I then repeated the medicine, giving half a grain of santonin in about 2 drachms of castor oil. This was retained for about eight hours, when it acted, bringing away a large number of threadworms, together with a few roundworms. The mother says that the child then became very weak and for two days lay as if she were dying, without moving her limbs or opening her eyes. But on the third day she began to recover and it was then discovered that she was quite blind. It was not till three weeks later that the parents, who live about 12 miles away on the top of the mountains, again brought the child to me. On examination I found that the girl was, as the mother stated, quite blind. Hoping that under treatment the sight might be restored, I got the mother to remain here with the child for about six weeks, at the end of which time, as the girl was still blind, she returned home with her. Though more than three months have elapsed since the child was brought here for treatment, I have not heard that the sight has been recovered.

I would like to know if any of the readers of THE LANCET have had a similar experience from so small a dose, and what treatment has been found beneficial in such cases. Stillé cites a case in which a child aged 6 months took 5 grains of santonin instead of 3 grains which had been ordered, and becoming amaurotic did not recover sight for two months. Hughes says, "it must be remembered that 2 grains have proved fatal to a child." In THE LANCET it has been recorded that 1½ grains caused convulsions in a child.

Dar-es-Salaam, G. E. Africa.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SURGICAL SECTION.

Fractures near Joints.

A MEETING of this section was held on Nov. 29th, Mr. RICKMAN J. GODLEE, the President, being in the chair.

The adjourned discussion on the paper by Mr. Robert Jones (Liverpool) on the Treatment of Fractures in the neighbourhood of Joints, which was published in THE LANCET of Nov. 19th, p. 1479, was opened by Mr. HERBERT J. PATERSON, who said that Mr. Jones had pointed out with regard to the treatment of fractures that there were two schools—one relying upon operative, and the other relying upon mechanical methods of treatment. The discussion indicated that there was less difference in principle between the two schools than was generally believed. Mr. Jones had told them that if he could not put a fracture into perfect alignment he operated. That was exactly the same position as that taken up by Mr. W. Arbuthnot Lane. His own practice was similar. The debate would not have been in vain if the principles upon which fractures should be treated had been clearly laid down, and it was interesting to learn that Mr. Arbuthnot Lane and Mr. Jones were in agreement as to first principles concerning fractures. There was one point upon which Mr. Jones had not touched. As Mr. Jones had observed, impairment of function was much more serious than any mere outward change of shape; but change of shape might be a serious matter for the surgeon. Whether they liked it or not, they had to recognise that since the introduction of X rays the public had become increasingly critical as to the results obtained in the treatment of fractures. The courts of law now were not satisfied that all possible had been done if the X rays demonstrated a result anatomically bad, however good the functional result might be. He was not arguing that that attitude was right, but he wished to point out that as the courts of law took that view surgeons must either accept it or try to alter it. It was interesting to learn from Mr. Jones that the use of a double inclined plane for fractures of the femoral condyles was based on a superstition, but at the same time he (Mr. Paterson) did not think that Mr. Jones's analogy with the treatment of an osteotomy of the femur was a true one. In a traumatic fracture there was much laceration and tearing of muscles, and, as a consequence, much greater displacement, than was the case after section of the bone with a chisel. Consequently, after osteotomy they would not expect to have to use a double inclined plane any more than they would think it necessary to use a screw or a plate. He (Mr. Paterson) confessed that his experience of the treatment of these fractures by splints and extensions had been very unsatisfactory, and although he pleaded guilty to having designed a special splint for these fractures he had come to the conclusion that in most cases an operation gave the best results. He agreed with all that Mr. Jones had said as to the harmful effects of early passive movements in fractures about joints, and believed that many of the bad results which followed these injuries were the outcome of the present advocacy—he had almost said mania—for early passive movement. He was glad to learn that Mr. Jones regarded as a superstition the belief that a joint would remain permanently stiff because it was kept immobile. There could be little doubt that many erred on the side of too short a period of fixation, and he thought that the periods of union of fractures laid down in text-books were too short. If at least a week or ten days were added to each period given they would not err on the side of too prolonged treatment. He supposed that some of the most troublesome fractures with which they had to deal were those about the ankle-joint. Few surgeons would assert that the treatment of these fractures was entirely satisfactory. Mr. Clinton Dent had told them that he had never known a member of the police force able to return to duty after a Pott's fracture. Correct alignment and accurate adjustment of the parts in this fracture was of such importance that he thought most cases were treated best with screwing or plating. He gathered that Mr. Jones's practice was tending in the same direction. It was probable, however, that the frequency of indifferent results was due to insufficiently prolonged treatment. They were apt to be satisfied if the patient left the hospital with a well-united, well-set limb, but they had often little idea as to the ultimate results. As Mr. Jones had suggested, the patient got about too soon, and a condition of valgus was the consequence. It had always struck him (Mr. Paterson) as remarkable that even the most vigorous opponents of the open treatment of fractures were usually enthusiastic advocates of operation in cases of fracture of the patella. This attitude did not seem readily explicable. Firm fibrous union of a fractured patella was the rule when treated without operation. There was no question of correct alignment, and it was not of great importance whether or not the fragments be brought into close apposition, and the fracture did not result in any shortening or deformity. No one could assert that there was absolutely no risk of sepsis in opening a knee-joint. And yet many of those who regularly operated in fractures of the patella maintained that it was unjustifiable to operate on a fracture of the femoral shaft. Personally, he considered that operation was indicated more certainly in the case of a fractured femur than in that of a fractured patella. In the case of the femur correct alignment was of the utmost importance. For his own part he did not advise routine operation on fractured patellæ because he believed that as good a result could be obtained without as with operation.

Mr. DOUGLAS DREW said that they had heard so much recently about the necessity of operative measures in the treatment of fractures that it seemed to him that the paper by Mr. Jones demonstrated what excellent results might be obtained by manipulative means in the hands of a skilful surgeon. Mr. Drew recognised that some of the fractures under discussion could only be treated satisfactorily by operative means, and believed that in the majority of fractures in the vicinity of joints an entirely satisfactory result could be obtained by manipulative means alone. Continuing, he observed that those who favoured operation naturally thought that they could obtain better results by so doing, and he thought they were liable to overlook the fact that even after operation the result, as demonstrated by the X rays, was by no means anatomically perfect, and often it did not appear to be better than in a similar case treated without operation. Mr. Drew thought that there was a tendency to minimise the fact that these procedures were often of a severe nature and, even with the most perfect technique, a failure from sepsis might occur with disastrous results. He thought that operation should be reserved for those cases in which it is impossible to get the fragments into a good position and in which impairment of function was certain to follow. His experience lay chiefly with children, and in 13 years as surgeon to the Queen's Hospital for Children he had seldom found it necessary to operate. His usual practice was to commence massage within a few days of the accident, and if there was no tendency to displacement of the fragments gentle passive movements should not be delayed; but he did not agree with Mr. Jones in thinking that they caused additional trauma and increased the stiffness provided they were carried out with sufficient care. The best guide was the absence of pain; he agreed that active movements should be encouraged, but in children this was one of the difficulties, and it was best overcome by showing the child that the injured limb could be moved without causing pain. With regard to separation of the lower epiphysis of the humerus, full flexion of the elbow sufficed to reduce the deformity in most cases, but sometimes, owing to the swelling, it was not possible to flex to the desired degree. Separation of the lower epiphysis of the femur with marked displacement was sometimes a very difficult injury to treat, and might necessitate operation. Mr. Drew concluded by describing an example of an extreme form of this injury, in which the epiphysis was displaced forward on to the anterior surface of the shaft and rotated so that the articular surface looked directly forward. It was found impossible to reduce this except by operation, and it could not be retained in position without the use of Lane's plates.

Mr. C. H. FAGGE said that it would be generally agreed that the great difficulty in restoring the normal alignment of such fractures was the small size of the articular fragment and the consequent inability of exercising upon it sufficient

leverage to bring its broken surface into true relation with that of the larger fragment; he therefore held that this class of injury was particularly suitable for treatment by open operation as introduced by Mr. Arbuthnot Lane. The necessity for accurate replacement varied in different positions of the body and also with the occupation of the patient, but was fundamentally called for in treatment of the common fracture of the region of the ankle—known as Pott's fracture whether of the adduction or abduction type—because of the serious mechanical disabilities such as flat foot and genu valgum which followed the usual inability to reduce the deformity by other means. Similar injuries in boys resulted in separation of the lower tibial epiphysis with fracture of the fibula, and in his experience operation alone restored the parts to their normal relationship; he had recently operated on such a case in which the diaphysis so far overhung the epiphysis and tarsus that an effort had been made in another hospital to reduce it as a dislocated ankle. He also held that many cases of supracondylar fracture of the humerus could not be replaced by manipulation, and showed some X ray photographs contrasting the position after manipulation under an anæsthetic with the real replacement fecured by open operation. In the common supracondylar sracture operation allowed of the evacuation of blood from the fossæ around the elbow and thus minimised the tendency to callus formation in this position, which later so frequently resulted in limitation of movement. Of all injuries in the upper extremity calling for operation Colles's fracture and separation of the lower radial epiphysis were the most common, and in these, as in many of those affecting the lower end of the humerus, replacement was all that was required, as when replaced the fragments remained in good alignment. Fractures near the shoulder did not usually demand operation, because movements of the scapula vicariously replaced those lost at the shoulder. X rays were of great value, especially in warning the surgeon in cases where the bones were so frail, as indicated by abnormal translucency to the rays, that screws could not obtain a firm hold.

Mr. W. H. CLAYTON-GREENE said that he did not agree with the views of Mr. Jones as to early movement. The first object to attain was rest for the injured parts, and yet they were told to commence movements at the end of the third day. Mr. Clayton-Greene said he was strongly opposed to such methods, and declared that except in the hands of most specially skilled people much harm resulted therefrom.

Mr. H. P. SYMONDS, Mr. A. E. JOHNSON, and Mr. A. J. WALTON also spoke, and Mr. R. J. GODLEE described how he had used an ivory peg in a case of fracture of the neck of the femur.

Mr. JONES, in replying on the discussion, thanked the Fellows for their kindly criticism, which showed that there was not any wide disagreement. He thought that if speakers gave their experiences it would teach extremists that there was more than one way of achieving the same result. In the hands of a clean surgeon he would not mind having almost any bone in his body wired. Again, if he could be assured of a good functional result without operation, he would be willing to forego a more artistic one. He had not known of a description of fractures of the spine of the tibia, and he thanked the President for the description of his case. He agreed one often found a rounded condition of the neck in traumatic coxa vara, which assured one that there was antecedent softening of bone. He had skiagrams showing separation of the epiphysis, starting from below as a little V-shaped space which gradually extended, resulting finally in a complete separation, the neck ultimately becoming rounded and resulting in a typical coxa vara. With regard to pegging or wiring where there was separation of the head of the bone in a young adult, he thought it unnecessary; if it were well abducted and extended there would be a good result. If it were decided to nail through the trochanter it should not be done without first exposing the joint. With regard to avulsion of the tibial tubercle, he had several photographs showing separation in various stages—the later photographs in some cases showing the separation more marked. Unless treated by complete rest, there was likely to be much thickening over the tubercle and tenderness on pressure. That was best treated by making a linear incision into it with a chisel, just as in the case of sclerosed bone, to relieve tension. He had seen this year two cases of Volkmann's ischæmic paralysis, so it did not yet belong to the past entirely. It took place as often from pressure within the arm as from pressure from without it. Cutting down on each tendon and lengthening it was not so effective as a simple procedure which he himself had demonstrated. It had been suggested that Bennett's fracture was never troublesome, but the speaker regarded it as one of the most difficult to treat mechanically, and he would be glad to hear what measures could be taken in that condition. Incomplete mobility so often occurred that he sometimes had to cut down to remove the fragment. Mr. Fagge said that Colles's fracture was very suitable for plating, but Mr. Jones thought Colles's fracture was one of the most amenable to simple treatment. Colles's fractures which resulted badly did not redound to the credit of either the surgeon or the patient. With reasonable coöperation there should be no bad result in cases of the kind. In dealing with acute flexion it was not sufficient to put the arm into an angle of 45°, but the flexion and supination should be complete, the hand almost resting on the shoulder.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Congenital Obliteration of Bile-ducts with Hepatic Cirrhosis.—Exhibition of Cases.

A MEETING of this section was held on Nov. 25th, Dr. E CAUTLEY, the President, being in the chair.

Dr. F. PARKES WEBER and Dr. G. DORNER communicated a paper on Congenital Obliteration of Bile-ducts with Hepatic Cirrhosis. The case was that of a female child, aged 6 months at the time of death, who had jaundice of the obstructive type with complete absence of urobilin (and urobilinogen) from the urine and the fæces. The liver and spleen were both considerably enlarged. The necropsy showed that the distal part of the hepatic duct, the cystic duct, and the common bile-duct were represented by connective tissue cords without any lumen, but the cord representing the choledochus could not be traced as far as the duodenum. Sections of the connective tissue cord showed not only complete absence of any biliary channel, but furnished no evidence that there ever had been any lumen. Perhaps the term "congenital atresia of bile-ducts," as suggested by Lavenson, was therefore more suitable for the present case. The gall-bladder contained a little slimy, colourless fluid. In the spleen the pulp tissue and supporting fibrous tissue were increased in amount. The liver was green in colour, the cirrhosis being of the unilobular (interlobular) type, which can be experimentally produced by ligature of bile-ducts (obstructive "biliary cirrhosis"). The liver and microscopical sections from the case were exhibited.

Dr. J. L. BUNCH showed a case of Morphœa in Band Form in a girl aged 5 years. Three years ago the child fell and bruised her forehead. Shortly afterwards a patch of sclerodermia appeared on the right temple, gradually spreading upwards on to the scalp and downwards on to the nose. Over the affected area the hair had disappeared and the skin was tense and atrophic.

The PRESIDENT exhibited a case of Splenic Enlargement in a boy, aged 6 years, whose family history was good and free from tuberculosis and syphilis. Three weeks previously sudden pain and swelling occurred in the ankles, which rapidly subsided. The eyelids and feet at first were œdematous; the urine was normal. The spleen was considerably enlarged and the liver slightly so. The blood showed a leucopenia. In the discussion both tubercle and syphilis were suggested as a diagnosis.

Mr. H. S. CLOGG showed a case of Extensive Necrosis of the Lower Jaw in a girl aged 7½ years. Two months previously the child had toothache and swelling of the face and submaxillary regions. The mouth could only be opened half an inch, and the tissues on the floor were indurated. The constitutional disturbance was great, the temperature rising to 103° F. On the gum and lower lip were large sloughs and a copious purulent discharge. The lower central incisors fell out, and the whole of the alveolus in this region was exposed. Other loose and carious teeth were removed, and antiseptic mouth washes were used with little improvement. As the pus yielded a pure streptococcus 10 c.c. of serum were given with marked benefit. Four other injections caused a fall of the temperature to normal on the tenth day. The child rapidly improved in health, but the sequestrum was still firmly attached.

Dr. T. R. WHIPHAM exhibited a case of Patent Ductus Arteriosus with deficient interventricular septum in a girl

aged 11 years. There was a history of cardiac distress since infancy, but there was no "clubbing" and no cyanosis except on occasions. The dulness of the heart and great vessels was increased to the left. At the apex there was a blowing systolic murmur, and over a localised area in the pulmonary region there was a continuous thrill and a loud "churning" rumble throughout systole and diastole. There was no evidence of enlarged glands.

Dr. PARKES WEBER showed: 1. A case of Nævus Verrucosus Linearis in a boy aged 3½ years. The skin of the trunk, neck, and extremities was largely affected with pigmented and verrucose nævus. The abnormality began when the child was seven months old. 2. A case of Congenital Transposition of the Viscera in a girl aged 10 years. Clinical signs and a skiagram showed a complete transposition of all the viscera. There was no valvular disease of the heart.

Dr. F. LANGMEAD showed: 1. A case of Rheumatoid Arthritis in a boy aged 13 years. The condition began two years ago and the hips, knees, ankles, elbows, wrists, and hands had been affected. The axillary glands were slightly enlarged, but no enlargement of the spleen had been detected. Skiagrams showed that the enlargement of the joints was periarticular. Improvement had been brought about by treatment with thyroid extract, which was given on account of the mother having had myxœdema for 15 years. 2. A case of Malformation of the Heart in a male infant, aged 8 months, who was cyanosed but did not show any appreciable "clubbing." The heart was enlarged to the left; a systolic bruit was audible over the cardiac area, especially at the xiphisternal junction and was accompanied by a thrill. The condition was possibly one of deficient interventricular septum.

Mr. O. L. ADDISON showed: 1. A case of old healed Tuberculous Disease of Knee-joint with increase in length of the limb. The boy first had signs of tuberculous disease of the knee in 1906. He was treated for six months, and afterwards had a Thomas's splint. For the last eight months he had been walking about and was free from recurrence. Movement in the joint was almost perfect, but the leg was one inch longer than the other, the femur and tibia being each half an inch longer. Skiagrams showed increased translucency of the tibial and femoral epiphyses with some irregularity of outline. 2. A case of Sarcoma of the Femur in a girl aged 1½ years. The growth, which was in the right femur, had been noticed for two months and did not appear to penetrate the bone (X rays). The liver and spleen could both be felt, and there were a few small glands in the left groin. It was not proposed to operate. 3. A case of Interstitial Hernia in a boy, aged 2 years, who had been operated upon for left inguinal hernia. There was a subcutaneous hernia of the size of a pigeon's egg above Poupart's ligament on the same side, and the left testicle was undescended.

Dr. G. A. SUTHERLAND exhibited a case of Cardiolysis for Adherent Pericardium in a boy aged 6 years. Eleven months ago the patient was admitted to hospital suffering from subacute rheumatism and rheumatic nodules. There was bulging of the præcordial region and a heaving impulse. The heart was greatly enlarged and a double murmur was audible at the apex. The boy became a chronic invalid, and adherent pericardium with dilatation and hypertrophy was diagnosed. Six months ago Mr. W. H. Clayton-Greene removed parts of the cartilages of the fourth to seventh ribs at the sternal junction to allow more freedom of action for the heart. Since then the boy had had one attack of cardiac failure, but on the whole he had been better and much more active.

The paper and cases were discussed by the PRESIDENT, Dr. J. W CARR, Dr. SUTHERLAND, Dr. H. D. ROLLESTON, Dr. J. D. ROLLESTON, Dr. J. PORTER PARKINSON, Dr. A. E. GARROD, Dr. T. R. WHIPHAM, Dr. E. I. SPRIGGS, Dr. F. W. HIGGS, Mr. W. MILNER BURGESS, and Mr. J. P. LOCKHART MUMMERY.

MEDICAL SOCIETY OF LONDON.

Heart Strain and Dilatation.

A MEETING of this society was held on Dec. 5th, Mr. CHARTERS J. SYMONDS, the President, being in the chair.

Dr. W. COLLIER (Oxford), in resuming the adjourned discussion on Dr. F. J. Goodhart's paper (see THE LANCET of Dec. 3rd), said that unfortunately heart strain in athletes had been on more than one occasion of late years the subject of discussion in the columns of the lay press. Anyone would gather from those discussions that the athletic competitions at public schools and universities were a potent cause of life-long injury to many boys and youths. But the real facts of the case were brought out in an inquiry made among the medical officers of schools and universities, who were almost unanimously of opinion that such care was taken in the matter that there was very little injury done.

Dr. SAMUEL WEST said that strain was a term in common use. A man was said to be working under great pressure or strain, nervous or physical, and when overworked to be suffering from nervous or physical breakdown. Strain in its clinical sense was that breakdown or overstrain. Cardiac strain in the same way might be nervous or physical. The two groups should be sharply distinguished, for the physical strain had its seat in the heart and nervous strain outside the heart in the nervous system. It might be stated that those in whom the nervous symptoms were most marked were least likely to show signs of organic disease. It would be well if the distinction could be marked by different terms, for heart strain was generally assumed to imply muscular failure. For the nervous group there was no satisfactory name. Functional affection or cardiac neurosis were at once too indefinite and too wide. The diagnosis between the two groups was of great importance, but it was just there that the difficulty came in, and mistakes were common enough to destroy confidence and necessitate caution. The cardiac symptoms were the same in both groups—viz., pain, palpitation, and shortness of breath. To those were added in the cardiac group the physical signs of dilatation—viz., displacement of the apex, increase of cardiac dulness and movement. The difficulties of diagnosis were increased by the fact that the two classes cut into one another. Thus the general ill-health accompanying a nervous breakdown might affect the heart muscle and make it to be feeble and to dilate. On the other hand, nervous symptoms might be added to the symptoms of organic disease and greatly aggravate the patient's suffering. No organ was more subject to nervous influence than the heart. Every one was familiar with the bursting feeling in the chest, the choking in the throat, and the violent palpitation of a nervous man who had to speak in public. Training was not merely muscular but nervous too, and in that case the nervous system began its work too soon. It was not till the heart was hard at work that it steadied down and relief was obtained. That was a good illustration of the beneficial effect of treating nervous cardiac over-action by work.

Dr. WALTER BROADBENT said there was one interesting method of examining a case of supposed heart strain which had not been referred to—that was by taking a tracing of the jugular pulsation in the neck with Mackenzie's polygraph. As far as his experience went, he had found that in cases which were functional or due to some form of dyspepsia there was no variation from normal in the jugular tracing, but in genuine cases there might be one of two conditions—either a very large auricular wave or a ventricular wave higher than the auricular. When the auricular wave had been large, presumably showing hypertrophy of the auricle, relief of symptoms had quickly followed the giving up of violent exercise for a week or two and the taking of a tonic. The patient had been able gradually to resume his old mode of life and the playing of games with only a little moderation. When the ventricular wave had been higher than the auricular, though rest, graduated exercise, and treatment had changed the character of the jugular curve and made the ventricular wave much smaller than the auricular, there had been great liability to relapse on any unusual exertion. Those jugular tracings were particularly useful when there was very little dilatation of the heart, and that perhaps masked by emphysema. When there was definite dilatation, it seemed to him better to put the patient to bed and give calomel and cardiac tonics, in order to see how much the heart would contract. He had seen the apex beat come in over an inch in a week. Massage was useful to keep the muscles in condition. As soon as the size of the heart appeared to be stationary, the patient could be gradually got on to his feet while the massage was continued. Afterwards he had a great belief in the Oertel system of graduated walking up hill. That was very easy to carry out in a hilly place like Brighton, every day one lamp-post further up the street, or, if the hill was steep, taking two to three days to reach the next

lamp-post. He had seen a gentleman last week who for a year up to last January had not walked 200 yards without getting out of breath; he was only 40 years of age, but had a dilated heart, said to have been brought on by sudden exertion. He had followed the Oertel system diligently, and now told him that he had reached 500 feet of altitude and six miles of distance daily. During the whole time the size of the heart had steadily decreased. That was an infinitely cheaper form of treatment than the Nauheim, and in his experience had given quite as good results.

Dr. ALEXANDER MORISON thought that Dr. Goodhart had rendered a public service in opening this discussion. He considered that the public had been unduly familiarised with the ideas of cardiac dilatation and strain during the last 20 years. While, however, he deprecated the attitude of the alarmist in medicine, he thought there was also some danger in that of the optimist. Hearts did dilate or become inefficient without gross organic disease, and it was quite possible unduly to minimise the importance of such conditions. Variations from the normal standard had to be examined carefully before being dismissed as unimportant. He did not think the argument from the right to the left heart was on all fours. The conditions involved were so different. While he regarded with suspicion all mitral leakages, he considered tricuspid leakage and right ventricular distension common and often physiological. He agreed with Professor Keith that left and right apical displacement was usually governed by the distension of the opposite auricle. Right auricular engorgement was common and often physiological, even in the presence of left ventricular disease; and the displacement of a variable apex beat to the left, also frequently physiological and of little moment. On the second head of the discussion concerning the neural origin of some persistent irregularities of the heart, he agreed with Dr. Goodhart, but considered that the question was now so much debated and of so interesting a character that it could not be adequately discussed as a rider to the general theme under consideration.

Sir JOHN BROADBENT agreed with Dr. Goodhart that the importance of percussion of the area of cardiac dulness as a means of estimating strain or dilatation of the right ventricle was greatly over-rated. It was not rational on percussing out the area of cardiac dulness for the first time in a new patient and finding that it exceeded somewhat the normal limits to say that the heart was necessarily dilated and required treatment. An athletic individual would naturally have a larger heart than an ill-developed bookworm, the increase in size being the physiological response to the increased demand. It was not the size of the heart as estimated by percussion that mattered, but its functional capacity that was all important. In aortic incompetence a certain amount of dilatation followed by hypertrophy was a part of the compensatory change. In diphtheria, in which a fatal syncopal attack was especially liable to occur, there was frequently no appreciable evidence of cardiac dilatation as shown by percussion. More valuable evidence as to the functional capacity of the heart could be gathered from the pulse, the character of the heart sounds and of the apex beat, or from symptoms such as breathlessness or præcordial pain on exertion, than from mere mapping out of the cardiac dulness. It was advisable in speaking of cardiac dilatation to distinguish between dilatation of the right side of the heart and that of the left. As a result of severe exertion the right side of the heart might temporarily be over-distended and a systolic tricuspid murmur make its appearance, but equilibrium would soon be restored in a healthy heart. It was a more serious matter when a systolic mitral murmur set in after exertion, as that indicated dilatation of the left ventricle. The important etiological factor in dilatation of the heart was loss of tone in the cardiac muscle. Such loss of tone might result from various toxæmias, and the dilatation of the right ventricle that ensued might be very considerable. This was especially the case in rheumatism, and here there was frequently not merely loss of tone, but extensive damage to the cardiac muscle, which would account for the extensive degree of dilatation met with in this affection. Ptomaine poisoning and auto-intoxication might also be responsible for such loss of tone. An atonic condition of the cardiac muscle might also be part and parcel of the general loss of tone throughout the muscular system due to exhaustion of the nerve centres from overwork or prolonged mental anxiety and strain, or some severe shock. In such conditions undue exertion might readily give rise to acute dilatation. The following were instances he had seen. A solicitor, greatly overworked, found that he could not play golf as usual on a Saturday without getting short of breath and very soon tired. He was found to have a soft systolic mitral murmur and an apex beat half an inch outside the nipple line. A strong athletic man after an accident in which a depressed fracture of the skull necessitated trephining, found that after his recovery from this he was short of breath on slight exertion and generally slack. On examination a similar condition of heart was found. In both these cases change to a bracing climate with rest at first, not in bed but simply taking things easy, followed by graduated walking exercise, led to complete recovery and all disappearance of the cardiac murmur. A large proportion of symptoms often attributed to cardiac dilatation, such as palpitation and other disorders of rhythm, fainting attacks, and various subjective sensations of pain and discomfort in the præcordial area were "neurons" of the heart or reflex disturbances which were commonly met with in highly strung individuals or in cases of nervous breakdown after prolonged strain or anxiety.

Dr. CHARLES W. CHAPMAN said the importance of dilatation depended upon (1) the age of the patient; (2) the general physical condition; and (3) the previous history. When the patient was young and vigorous and had his heart strained then, although he had some dilatation, irregular action, and possibly a soft systolic mitral murmur, a short period of rest would in most cases be all that was necessary. In patients past middle life, although they might up to the time of the strain hold a clean bill of health, the prognosis and the length of rest necessary would depend upon the state of the vessels and of the more important viscera, especially the kidneys. He had recently seen a gentleman about 60 years of age, who had severe cardiac symptoms after dancing. He had never been ill. The serious nature of the case was not recognised and he was allowed to travel. On his arrival home he was very ill, and when seen by Dr. Chapman in consultation his heart was greatly dilated, and he had all the signs of back pressure, to which he rapidly succumbed. Had that patient been put to bed at once and had complete rest he would in all probability have got better. With reference to the previous history, that of syphilis was of paramount importance, particularly if aortic as well as cardiac dilatation existed, when prolonged rest, in conjunction with treatment, was of vital importance. As to whether the limits of cardiac dilatation could be defined with any approach to accuracy, he was confident it could by percussion properly performed by one practised in the art, though something of a musical ear was a great assistance. At the same time, to pretend to make measurements to a hair's breadth was as ridiculous as it was useless.

Dr. LEONARD GUTHRIE agreed with Dr. Goodhart that the physical signs supposed to indicate heart strain and dilatation—namely, slight displacement outwards of the apex beat, an impulse varying in force and direction and speed, irregular and intermittent action, together with the presence of bruits, systolic in time over the pulmonary valves, and sometimes audible from the apex to the level of the pulmonary area, varying with the patient's position, were unreliable as evidence of cardiac dilatation. He thought, however, that they might be regarded as evidence of past strain and dilatation, and of potential dilatation should the patient indulge in over-exercise. It did not follow that because signs of dilatation were absent at one time that they had not been and would not be present at another. He agreed again with Dr. Goodhart that the symptoms—fainting attacks, pains over various parts of the præcordial area, sighing respiration, palpitation, collapse with sensation of impending death, and extreme lassitude after smallest exertion—were not those met with in cases of cardio-valvular disease. Still, the symptoms were no doubt of cardiac origin in spite of the fact that the patient was as a rule neurasthenic to an extreme degree. He did not think it altogether safe to treat such patients as neurasthenics without reference to their cardiac condition. If one reassured them and said there was nothing the matter with their heart they were extremely likely rashly to over-exert themselves and thus make matters worse, as in one of Dr. Goodhart's own cases. He believed that the most frequent cause of cardiac strain and primary dilatation was

over-exertion following an attack of influenza. Although, as Dr. Goodhart stated, treatment by rest might be overdone, he was convinced that in all acute cases it was necessary for at least a month. Gentle and graduated exercise might then be prescribed, but athletics and all prolonged or severe physical exertion should be forbidden to those who had once suffered from definite symptoms of cardiac strain and dilatation.

Dr. F. PARKES WEBER having spoken, Dr. GOODHART replied, and the meeting concluded.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF SURGERY.

Transperitoneal Cystotomy, with Report of a Case.—Diagnosis of Renal Calculus.

A MEETING of this section was held on Nov. 18th, Mr. R. H. WOODS, the President, being in the chair.

Mr. SETON PRINGLE read a paper on Transperitoneal Cystotomy for Tumour of the Bladder, with Report of a Case. He gave a history of this operation, and compared the results obtained by it with those obtained by operating by the suprapubic route. He advocated this method in all cases of tumour, except those situated at the apex of the bladder. He described the operative technique in detail, and illustrated the various steps by lantern slides. The paper concluded with a report of a case of papilloma successfully dealt with by this route by Mr. Pringle.—Mr. A. J. BLAYNEY said that he had used the method twice, and he could confirm what Mr. Pringle had said with regard to the excellent view of the bladder obtained. The after-treatment he had used was to drain the bladder for a few days, and afterwards urine was passed quite readily.—Mr. JAMESON JOHNSTON said he had not done the operation, but it appealed to him as being scientific, and based on anatomical principles, and one certain to be very useful in the future, but he would not use the transperitoneal method unless he thought the other method was not sufficient.—Mr. C. A. K. BALL said he had attempted to do transperitoneal cystotomy in the case of a man, aged 56 years, who had a malignant tumour of about the size of a five-shilling piece involving the left ureter. On opening the abdomen it was found that there was a mass of secondary growth completely adherent to the iliac vessels. The case was therefore inoperable and the abdomen was closed. He was much struck with the splendid access to the bladder that was obtained. Although in a thin patient it was one of great ease, in a fat person there was difficulty in keeping the intestines back before opening the bladder, but when opened the tumour was easily removed and the result was satisfactory. He did not gather whether Mr. Pringle had used the valuable aid of the electric head-lamp which had been brought to his notice by the President. With the head-lamp one was able to work with a smaller incision in the bladder, and the interior was readily illuminated.—Mr. W. I. DE C. WHEELER said that, considering the mortality of the removal of benign tumours, it was time some new methods of technique were developed. He had been impressed with Mr. Pringle's work, and on his advice had used the transperitoneal method. The operation had great advantages over the ordinary suprapubic method, and he would be inclined to use it in every case of tumour of the bladder where there was any difficulty in the removal of the tumour.—Mr. K. E L. G. GUNN asked if Mr. Pringle meant that the operation was to be done in all cases of the bladder or only in carcinoma. He had operated on eight cases of malignant growth in the bladder. In one of the cases he had not recognised malignancy before the operation and found the growth too late to do anything. In two cases he did the transperitoneal operation, and in one case had to replant the ureter higher up in the bladder wall. The patient died five years after the operation. The second survived the operation, but died from recurrence five months afterwards. In four cases of radical suprapubic operation, one died 12 months later, one died in nine months, one was still alive three years after operation, and another four years. One should adopt whatever method was most convenient to get at the growth. No matter how carefully they sutured, there was a danger in the transperitoneal method of leakage of urine.—The PRESIDENT said that, in his opinion, no cavity operation could be as well done without an electric head-lamp as with it, but for the purpose they must have a theatre that was not too highly lighted. If they had a subdued light sufficient to enable the assistants to do their work, and others to see what they wanted to see, and they used a suitable lamp with a large concave reflector that could be varied, he was of opinion that, no matter what the operation was in a cavity, they would be able to see ever so much better, and they would never go back to the old plan that compelled them to put their head between a light and the cavity.—Mr. PRINGLE, in reply, said he did not advocate the operation for all tumours. He thought it had not been done often enough to be quite sure of its mortality. He was inclined to advocate it in all cases except those of tumour situated near the apex of the bladder. One would think that with the transperitoneal operation, even with the risk mentioned by Mr. Gunn, they should have a less mortality than the immediate mortality of 10 per cent. with the suprapubic method. One could form a fair idea of malignancy with the cystoscope, but it was not sure, and the transperitoneal method enabled them to deal much more radically and rapidly with the tumour. He had good light in his case, and he thought the chief point was to get the patient into a very high Trendelenburg position so that he was almost vertical, and the light of the theatre window shining in. He did not personally feel the need of a head-light. As regards the risk of the operation, a great many of the 23 cases reported by him, from American literature, were septic bladders. Richardson in America had taken out two large stones in two cases in which the bladder had tightly contracted down. He did the transperitoneal operation in both cases, the bladder being intensely septic, and both recovered without peritonitis.

Mr. MAURICE R. J. HAYES in a paper on X Rays in the Diagnosis of Renal Calculus laid special stress on the necessity for thorough evacuation of the intestines in order to obtain a satisfactory radiogram. A description of a simple method of obtaining compression of the kidneys by means of an ordinary girth was given. The various causes to which errors in diagnosis may be due were discussed, and radiograms illustrative of these were shown. The use of radiography as the only method of diagnosis of calculi was not recommended, but taken in conjunction with the ordinary methods of diagnosis it furnished more valuable information than could be obtained in any other way.—Dr. W. S. HAUGHTON said he did not think that X rays should be used to replace the ordinary methods of clinical examination, but rather to confirm them. He had never known a Roentgen picture to make a mistake with regard to a stone in the kidney. With regard to controlling the respiratory movement of the kidney, the strap mentioned was an admirable addition to the work. There were other methods of extreme usefulness.—Sir JOHN LENTAIGNE said the X rays were so valuable a help that they were tempted to drop the more laborious methods of diagnosis.—Mr. HAYES, in reply, said he had invested so much in apparatus that he was afraid to put more money into the Albers-Schönberg compressor. He thought it was a cumbersome and heavy affair, and everything could be obtained by a contrivance at an expense of 3*s.* 6*d.* He had recently used a rubber air-pillow, and found that he got the shadow of the air-pillow transversely on the plate. One disadvantage of the air-pillow was that the position of the patient changed during exposure. He expressed his thanks to the speakers for their kind remarks.

Mr. GUNN read a short paper on the Diagnosis of Renal Calculus, giving briefly the chief symptoms and the relative values of such symptoms in diagnosing renal calculus. Mr. Gunn then discussed the question of how far the opinion of the radiographer should influence the surgeon in his treatment of the patient.—Dr. W. G. HARVEY supplemented Mr. Gunn's paper with a few remarks on the X Ray Diagnosis of Renal Calculi. He agreed with Mr. Gunn that the radiographer should examine the whole urinary tract. In the great majority of cases a negative diagnosis was justified by the absence of a shadow in a sufficiently good negative. Such a negative should show (1) the last ribs; (2) the tips of the transverse processes; (3) the line of the ilio-psoas muscle; and (4) the outline of the lower pole of the kidney. He then showed some lantern slides illustrative of these points.—Dr.

HAUGHTON said that if there was any doubt they should repeat the photograph some time later. But a quicker and more satisfactory way was to take a stereoscopic picture by Mackenzie Davidson's method. It was astonishing how two rather indifferent negatives would yield an excellent stereoscopic result. The question of including the opposite kidney was most important. He had come across patients in which the pa'n was referred to one side, and there were two large stones in the opposite kidney.—Dr. H. STOKES said they could get the symptoms of stone from a hypernephroma. Most of these were not diagnosed until too late. Cases reported showed the surgeon practically certain of stone. If the radiographer took two photographs and found no stone, were they to sit down and let the patient die?—Mr. PRINGLE and Mr. HAYES also spoke.—Mr. GUNN, in reply, said he did not attempt to deal with the differential diagnosis. What Dr. Stokes said was perfectly true. There were other conditions which made it difficult, but time would not permit their discussion.—Dr. HARVEY also replied.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

Discussion on Blood Pressure.

A MEETING of this society was held on Nov. 30th, Dr. BYROM BRAMWELL, the President, being in the chair.

Dr. GEORGE ALEXANDER GIBSON, in introducing a discussion on Blood Pressure, first gave a definition of the terms employed in studying arterial pressure. The *maximal* or *systolic pressure* was gauged by that which would arrest the flow in the vessel. The *minimal* or *diastolic* pressure was estimated by the point of greatest lateral oscillation. The *mean pressure* was that half-way between maximal and minimal, and the *pulse pressure* was the amount of difference between maximal and minimal. But these pressures were lateral—i.e., exerted on the walls of the vessels—and the *terminal pressure* consisted in this pressure plus the velocity. The lateral pressure in an artery was usually held to be equal to the terminal of the next branch. The $\frac{\text{pulse pressure}}{\text{systolic pressure}}$ = co-efficient of pressure; thus, in a person in health if the systolic pressure were 120, the diastolic 90, the pulse pressure 30, and the pulse-rate 70, then $\frac{\text{P.P.}}{\text{S.P.}}=\frac{30}{120}=\frac{1}{4}$ co-efficient, and $\frac{\text{P.P.} \times \text{P.-rate}}{\text{S.P.} \times \text{pulse-rate}}=\frac{\text{velocity}}{\text{work}}=\frac{30\times70}{120\times70}=\frac{2100}{8400}=\frac{1}{4}$, or the efficiency of the heart in health. In an instance of heart-block S.P. 270, D.P. 90, P.P. 180, P.R. 30, $\frac{180\times30}{270\times30}=\frac{5400}{8100}=\frac{2}{3}$. The factors which maintained the arterial pressure were as follows: 1. Energy of the heart. 2. Access of blood. It had long been known that any obstruction lessened the distal pressure and increased the proximal, and Dr. Gibson narrated an illustrative case of obstruction to the subclavian. 3. Elasticity of the vessels. During the systole the vessels became dilated and the potential energy thus stored up was given out later as kinetic energy in their contraction. 4. Resistance in arterioles; resistance and pressure were reciprocal. Increased resistance was equal to higher pressure, and *vice versâ*. Resistance was due to tonus of vessels which resulted from the antagonistic action of vaso-constrictor and vaso-dilator nerves; the former were always in action, the latter only when required. 5. Character of the blood. Dr. Gibson had observed that density of blood and pressure were in direct ratio, and viscosity of blood stood in the same relation. Chemical impurities, for the most part, increased pressure. 6. Quantity of blood. It might be expected that increased volume would cause increased pressure. This was, however, amply compensated for by vasomotor activity. With regard to the methods of estimating arterial pressure, Dr. Gibson narrated the earliest observations made by ascertaining the height of a column of blood from an artery, and later by the use of a mercury manometer for the artery and a water manometer for the vein; while still more recently the spring manometer had been introduced. The different forms of kymograph were alluded to. He spoke of the early studies of the pulse and the importance of educating the sense of touch in this relation. He said that the only accurate instruments were those based on estimation by means of a column of mercury. The systolic pressure was gauged by the amount of external pressure necessary to overcome arterial resistance; while diastolic pressure was estimated by the maximum waves of the column of mercury. Dr. Gibson described the instruments of Erlanger and the recording instrument suggested by himself. As regarded the possible fallacies in the methods, he alluded to: (1) the instrumental; (2) the personal equation; and (3) the state of the walls—Herringham stated that the maximum pressure exerted by these was 35 millimetres. Dr. William Russell held that increased tonus could add to this, but the muscular coat of a large artery was not so large relatively as a small artery. As to the clinical results, the cardiac muscle and arterial pressure were reciprocal, and arteriole contraction and arterial pressure were also reciprocal. With high arterial pressure there was a loud aortic second sound, going on to hypertrophy; with low pressure there were feeble sounds. Vascular crises (both high and low pressure) of Pal gave changes in the amount of secretion, renal and salivary. Nervous causes lead to high pressure, and worry to this and to sclerosis; while, on the other hand, from high pressure nervous instability in varied forms resulted. Nervous causes could give low pressure, and in the opposite sense low pressure led to nerve depression. Abnormal extremes: In interstitial nephritis and arterial degeneration 260 D.; 300 S. Addisonism, 60 D., 90 S. Greatest pulse pressure in aortic escape, 70 D., 150 S., and in heart-block 80 D., 270 S. In infective diseases there was an early rise and early fall; this was very marked in typhoid fever. In lead poisoning the pressure was high throughout until recovery, and in gouty conditions it was also high. It was interesting to note that, apart from aortic disease, valvular lesions had little influence on pressure. In aortic incompetence the pressure in the arteries of the legs was much higher than in the arteries of the arms. Arterial sclerosis: There was a general consensus of opinion that retained poisons as well as those from outside caused this disease. There might be arterial sclerosis without high pressure, as of 500 cases examined by Groedel in 35 per cent. there was none; Rudolf with Ellis and Robertson found 50 per cent. of cases with none: and D. Elliot Dickson found thick vessels with only moderate pressure in miners. The relation of high pressure to angina pectoris was discussed. Respiratory diseases: The pressure was high in asthma and low in phthisis. Glandular diseases: In myxœdema the pressure was high; in exophthalmic goitre it was usually low, but was very variable. In Addisonism, low if the medullary portion of the gland were affected. Renal disease: The pressure was usually high from retention of poisons, but much depended on previous conditions. In chronic Bright's disease it was always high; in amyloid changes, usually low; in uræmic poisoning, high. In conclusion, Dr. Gibson discussed the value of arterial pressure in prognosis and as a guide in therapeutics.

Dr. WILLIAM RUSSELL said that in the time at his disposal he could not debate the question before the society. He could only try to define what he considered to be the essential phenomena in the subject under consideration. He would begin at the extreme end and take as an example of it a patient admitted to hospital with a brachial pressure of 295 mm. Hg. Under rest and treatment it fell to 165. It rose and kept about 190 to 210, but it would suddenly rise 70 to 80 mm. more with symptoms which there was no time to describe. This patient had thickened vessels, and along with the rise in pressure the vessels, including the brachials, underwent hypertonic contraction.[1] Nine years ago he had made a communication to the society on arterial hypertonus, in which he pointed out that hypertonus occurred in normal and in sclerosed radial arteries; with the advent of the modifications of the Riva Rocci instrument he had carried his observations to the brachial artery and found that it became greatly thickened, and that it could in favourable cases be both felt and seen to diminish greatly in size and increase greatly in the thickness of its wall during such hypertonic contraction. When this contraction took place the pressure in the aorta was raised—how much there was no means of determining, for there was a great power of restoring the balance and relieving the

[1] THE LANCET, Dec. 3rd, 1910, p. 1602.

heart. The essential phenomenon was the arterial hypertonic contraction and that it embraced such vessels as the brachials. His contention was that the hypertonically contracted and sclerosed arterial wall was a large factor in the production of the brachial reading. A source of fallacy occurred from the fact that in some cases a brachial artery, although thickened, was dilated and atonic, and such a vessel gave a relatively lower reading. A man had died in his ward last week who came in with a failing big heart—failing on both sides; the lungs were congested and he began pouring out fluid into both pleuræ, the heart sounds could not be heard, the pulse was a mere flicker at the wrist, the radial arteries were calcareous, the brachials were large, sclerosed, and tortuous, and the brachial pressure during this state of affairs was 140 mm. Hg. In one set of observations he found the pressure in the forearm was 30 millimetres higher than that in the upper arm. At the post-mortem examination the myocardium of the left ventricle was soft and fragmented, and that of the right considerably replaced by fat. Yet eminent clinicians write on blood pressure and heart power, estimated by the hæmomanometer, without a reference to the arterial wall. To him that position was beyond comprehension, and he left it to them as to whether they were prepared to accept it. He would now ask their attention to the other extreme, and could illustrate this by reference to two patients: the one convalescing slowly after an acute pericarditis was quite comfortable with a brachial pressure of 120 millimetres. When from constipation, an error in diet, or emotion the pressure rose 15 or 20 millimetres he got cerebral breathing and the pulse intermitted. When this rise took place the radial and the brachial arteries could be felt to have become smaller from hypertonic contraction—that was not an opinion, that was a clinical fact—the contraction threw an increased pressure into the aorta, and the feeble myocardium was embarrassed. The symptoms could be promptly relieved by giving a vaso-dilator. The second case was a medical friend, aged 80 years, who was having recurring attacks of angina pectoris minor. During these attacks the radials became small and the brachials also became contracted with a very poor wave in them; the pressure showed 140–150 mm. Prompt relief could be obtained by a vaso-dilator, and the pressure fell to 120–125. He found that they entirely overcame this vessel sensitiveness and removed the symptoms by the administration of a very small quantity of iodide of potassium. In both these cases the essential and fundamental clinical phenomenon was the arterial hypertonus, just as it was when the vessels were sclerosed. The constriction might or might not embarrass the heart. No one knew what the pressure was in the aorta; and with the armlet of the hæmomanometer they measured the changes in the arterial wall as well as the pressure inside it.

Dr. HARRY RAINY discussed the physics of the problem. When the pressure was applied by a band to the upper arm the tissues were assumed to be compressed as if they were a fluid, and therefore the constriction was transferred directly to the vessel. This was a point subject to discussion, and it was known that if there was much œdema the facts were admittedly erroneous. There was also the question of the rigidity or relaxation of the muscles. The question of the vascular walls was purely a physical one; a blood-vessel lived for long and experiments could be carried on with it after excision from the body. By perfusing certain fluids through it hypertonus could be set up. The condition of the vessel wall would cause change in pressure. The brachial pressure was a central one, and not far off that observed in the heart, while the pressure became enormously greater the smaller the blood-vessels became. The pressure was really peripheral to those which were investigated—viz., the brachials.

Dr. D. ELLIOT DICKSON (Lochgelly) said that he had investigated this problem in 500 healthy miners of all ages. In 456 there were thickened, easily palpated accessible arteries. In 116 youths under 20 years of age the radial artery was easily palpated, and only 44 miners had such arteries which could not be palpated. Only 31 showed a systolic pressure of over 140 mm., or 6 per cent.; there was no albuminuria. 469, or 94 per cent., had brachial pulse readings within normal limits, and nearly all had thickened arteries. The vessels were equally thickened from the periphery right up to the axilla. They felt like lead pencils and were almost incompressible. He thought that the cause of this thickening might be due to toxic conditions of their work underground. He had observed this thickening of vessels to occur within one year of their commencing underground work. He had determined that in the air of well-ventilated coal mines there was an enormous excess of carbonic acid gas; it might amount to 0·7 per cent., in comparison with the normal 0·03 or 0·04 per cent.

Dr. H. OLIPHANT NICHOLSON spoke of the blood pressure in pregnancy. He said that all the conditions present during the later stages of pregnancy might be thought to favour increased blood pressure, but his observations showed that there was no definite rise of blood pressure until the commencement of labour pains. The uterine contractions raised the pressure, and this rise increased during the expulsion of the child. Operative procedures still further raised the pressure, even though the patient were anæsthetised. After the third stage of labour there was a distinct fall in pressure, but after the third day of the puerperium there was a definite rise. If there were a continuous rise above 130 mm. one might suspect eclampsia. The blood pressure was usually higher in primiparæ than in multiparæ. As a result of pregnancy a vaso-constricting substance was retained in the system and accumulated to a dangerous amount in eclampsia. It caused the albuminuria and suppression of urine by altering the circulation through the kidneys. This substance was probably elaborated from the placenta. Owing to this widespread constriction of the arteriole field much extra work was thrown upon the heart.

Dr. THEODORE SHENNAN said that in thickened arteries which were calcareous a constant feature was present—viz., the absence of this calcareous change at the flexures. At Munich the greatly dilated heart and arterio-sclerosis of vessels so often met with at post-mortem examinations were attributed to the excessive amount of beer drunk. The viscosity of the blood seen in cases of polycythæmia where the heart was not hypertrophied might be due to greatly sclerosed conditions of the coronary arteries.

Dr. EDWIN MATTHEW referred to drugs employed to reduce arterial blood pressure, and said that with the exception of the nitrites and iodides they were useless. It was said that iodides acted by reducing viscosity or that they affected the nutrition of the vessel wall, or that they stimulated thyroid secretion. Iodides were useful in cases of high blood pressure with no arterio-sclerosis, and this was where they found their true action. Iodides were pure vaso-dilators just as nitrites, and acted in no other way. Iodide should be given in minimum doses of 10 grains thrice daily, rapidly increased for some days, and then decreased. It had to be remembered that many organic preparations of iodine contained only 2 grains in each dose.

Dr. HENRY M. CHURCH had found the test for high blood pressure a most useful one as regards therapeutics. The time at which the pressure was taken was important; before breakfast the pressure might be 15 to 20 mm. lower than after, and the same occurred before and after smoking, taking a hot bath, &c.

The PRESIDENT said that he never could understand how it was said that the condition of the vessel wall had no effect on the blood pressure. One might have thickened arterial vessels without any obvious rise in the blood pressure owing to parts of the vessel being left elastic. He had great difficulty in accepting Dr. Russell's view that the brachial and radial arteries from a condition of spasm could give rise to such high readings.

SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

Exhibition of Cases.—Double Frontal Sinus Disease.—Purulent Labyrinthitis.

THE first meeting of this new society was held on Nov. 11th at the Royal Infirmary, Edinburgh, under the chairmanship of Dr. A. LOGAN TURNER.

Dr. W. G. PORTER showed a patient two and a half years after Operation on the Right Labyrinth. Granulations were removed from the region of the horizontal canal, but the remaining canals and the cochlea were not interfered with. The vertigo had disappeared and the patient could follow his employment, but complained of severe tinnitus. It was a

question for discussion whether any further surgical treatment should be carried out.—Dr. J. KERR LOVE and Dr. THOMAS BARR advised against this, and Dr. J. M. FARQUHARSON suggested the use of the high-frequency current and injections of fibrolysin.

Dr. PORTER reported the case of a patient with Clonic Spasm of the Right Vocal Cord and Soft Palate. The movement of the cord consisted of a rapid adduction and a slower abduction, and the rate was about 150 a minute. It was thought that the phenomenon was due to bilateral cerebral disease probably associated with arterio-sclerosis. The patient died suddenly, but no post-mortem examination was obtained.

Dr. J. D. LITHGOW read notes of a case of Double Frontal Sinus Disease with cerebral involvement. There was a deficiency of the cerebral wall of the right sinus and through this a fungating mass of necrotic cerebral tissue presented. Operation resulted in recovery.

Dr. J. S. FRASER reported a somewhat similar case which, however, ended fatally. In this patient the frontal sinus suppuration was complicated by extra- and intra-dural abscesses in the frontal region.—Dr. W. S. SYME, in the discussion, remarked on the increasing frequency with which reports of intracranial complications of frontal sinus disease were being published, and pointed out that in reference to the question of operation on the sinus this danger must be taken into account.—Dr. TURNER stated that, besides these two cases, one other, making three within the year, had occurred in the Edinburgh Royal Infirmary, and he drew attention to the statistics of Gerber, who has collected 150 cases of intracranial disease following suppuration in one or other of the nasal accessory cavities.

Dr. FRASER read notes of a case of Purulent Labyrinthitis with death from lepto-meningitis and gave a lantern demonstration. This showed the condition after operation. The vestibule was efficiently drained, but pus was present in all the coils of the cochlea, especially in the scala tympani, in the ductus endolymphaticus, and in the ductus perilymphaticus. The inflammatory process could also be traced to the internal auditory meatus from the scalæ of the cochlea along the branches of the cochlear nerve.—A discussion took place, in which Dr. T. BARR, Dr. KERR LOVE, and Dr. ALBERT A. GRAY took part, as to the indications for opening the internal ear spaces, the general opinion being that there was a tendency at present to too hasty interference with the labyrinth in aural suppuration.

Dr. FRASER showed a patient on whom Killian's operation had been performed for Unilateral Frontal Sinus Disease.

Dr. J. MALCOLM FARQUHARSON showed a patient presenting symptoms of Cerebro-spinal Rhinorrhœa. The condition followed a severe fall on the back of the head. There was a clear watery discharge from the right nostril presenting the characteristics and conforming to the tests of cerebro-spinal fluid. The patient suffered from severe headaches before the nasal discharge commenced. There was now complete double optic atrophy, and on the right side deafness of nerve type. The nasal passages were narrow but otherwise healthy.—In the discussion Dr. TURNER suggested the presence of an intracranial tumour and recommended that the patient should be examined by a neurologist, and Dr. SYME advised the performance of spinal puncture.

Dr. FARQUHARSON also showed: 1. A young woman who had sudden attacks of Angio-neurotic Paralysis of the Right Acoustic Nerve, associated with vertigo, deafness, severe tinnitus, pallor of the face, and nausea. Complete recovery followed in a few minutes. On examination the ear was normal. Under treatment by X rays and electric current to the sympathetic in the neck, with injections of 1 in 1000 adrenalin, the attacks had become less frequent and severe. 2. A patient on whom Rougé's operation had been performed to permit of the treatment of extensive Lupus of the Nasal Cavity. 3. A man with a large Epitheliomatous Growth of the Pharynx in whom treatment by X rays and radium had resulted in retardation and diminution of the growth with relief of pain, with, however, succeeding rapid extension. 4. A patient with a large Choanal Polypus on the left side. By posterior rhinoscopy its attachment to the posterior part of the middle meatus could be seen. (Dr. A. BROWN KELLY offered some observations on the relation of these polypi to the antral cavity.) 5. A patient with a Papilloma attached to the anterior third of the left vocal cord. 6. A man with Congenital Malformation of the Larynx. The left arytenoid prominence was much smaller than the right, probably from an absence of the accessory cartilages. The patient came to the hospital for some trouble unconnected with the larynx. The movements of the cord and the voice were normal.

Dr. TURNER showed a female with a large, tense, freely moveable Swelling in the Floor of the Left Nostril just inside the ala. A diagnosis of retention cyst of one of the mucous glands was made.—Dr. KELLY, Dr. R. FULLERTON, and Dr. FRASER agreed with this, and the first referred to a number of similar cases which he had seen, remarking on the much greater frequency with which, from his experience, they occurred in females than in males.

Dr. TURNER also showed: 1. A case of Laryngeal Tuberculosis in which an 85 per cent. solution of alcohol had been injected into the right superior laryngeal nerve for the relief of dysphagia. The patient had had two injections at an interval of three weeks with relief of the pain, especially since the latter injection. Unfortunately, the disease had extended to the left side so that the relief was only partial. (Dr. H. PETERKIN made some observations on this method of treatment.) 2 and 3. Two cases of Acute Lepto-meningitis complicating chronic middle-ear suppuration; recovery. One, a male aged 16 years, had had left middle-ear suppuration for years. A week before admission he was seized with acute symptoms, vomiting, headache, vertigo, and elevation of temperature. Lumbar puncture showed the cerebro-spinal fluid under pressure, slightly turbid, with excess of albumin. A radical mastoid operation was done, but no evidence of inner ear disease was found. Two days later he had rigidity of the neck, double Kernig's sign, severe headache, and high temperature, but no optic neuritis. A second lumbar puncture was done, and from the fluid withdrawn streptococcus pyogenes, bacillus proteus, and a Gram-positive anaerobe were grown, and the same organisms were found in the discharge from the mastoid. Antistreptococcic serum was injected into the spinal canal on two occasions, and subcutaneously on five, and spinal puncture was subsequently performed. At the end of three weeks all the symptoms had disappeared. The second case, a male aged 29 years, was somewhat similar except that in him in the left, the diseased ear, there was evidence of vestibular impairment, the caloric reaction being negative, and there was spontaneous nystagmus towards the healthy side. The cochlear nerve remained active. Symptoms of meningitis showed themselves, but there was no optic neuritis. Lumbar puncture showed fluid under pressure and turbid, containing polymorphonuclear leucocytes, lymphocytes, and degenerated epithelial cells. A radical mastoid operation was performed and a cholesteatoma evacuated. Openings were found in the external semicircular canal and in the oval window, discharging dirty fluid. Drainage was established. A second lumbar puncture showed Gram-positive and Gram-negative bacilli and Gram-positive cocci. The mastoid and inner ear secretion showed streptococcus pyogenes and a diphtheroid bacillus. Lumbar puncture was performed on several occasions and antistreptococcic serum was injected into the spinal canal and subcutaneously. Gradual improvement and ultimate recovery resulted.—Dr. J. STODDART BARR and Dr. SYME discussed these two cases.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.—A clinical meeting of this society was held at the Sussex County Hospital on Nov. 23rd, Dr. F. Hinds being in the chair.—Dr. W. Broadbent showed a case of Aneurysm in a woman. There was no history of syphilis, but she had been nursing a very stout lady for two years, which involved heavy lifting. She came complaining of cough, hoarseness, and pain in the chest. There was no difference between the pulses and the pupils were equal. There was perceptible pulsation in the first and second left spaces for 2½ inches to the left of the sternum, and this area was dull on percussion. There was a loud booming second sound characteristic of aneurysm, more marked in the first space, and heard even beyond the mid-clavicular line. At the aortic cartilage the second sound was loud and somewhat altered in pitch. The breath sounds were a little diminished on the left side owing to pressure on the left bronchus. There had been very numerous crepitations in the left lower lobe, probably caused by obstruction to the pulmonary vein. The left vocal cord was paralysed. The prognosis was bad owing to the structures pressed upon.—Dr. Broadbent also showed a case of Progressive Muscular Atrophy in a woman, and a case of Aortic Regurgitation in a man aged 24 years.—Mr. H.

Nethersole Fletcher showed a boy, aged 11 years, with a Swelling on the Lower Part of the Tibia. Four months ago he first noticed this just above the left ankle, which had gradually increased in size. There was no pain and no limping. The swelling was hard, slightly nodular and bossy, and not tender. It measured about 1½ inches each way. X rays showed that it arose from the region of the epiphyseal line of the tibia, and that it was in the main composed of fully formed bone lamellæ continuous with those of the cancellous tissue of the shaft of the tibia. The outer surface was capped with dense bone about a quarter of an inch thick. The fibula was directly pressed upon it, and over the area of pressure had been bowed outward and partly absorbed. It was probably a cancellous osteoma or a chondroma which had ossified growing from the epiphyseal line.—Dr. J. F. Gordon Dill showed a series of cases of Glycosuria in which a careful estimate had been arrived at of the amount of carbohydrates which each individual patient was capable of assimilating, and in which a reduction in the diet to this amount had been followed by a disappearance of the diabetic symptoms and of the sugar in the urine. He also showed a case in which there had been continual fever for four weeks with a positive Widal reaction in which after removal of some carious teeth the temperature became and continued to be normal and the patient recovered perfectly.—Dr. E. Hobhouse showed three cases of Paraplegia of different type. 1. A girl, aged 12 years, was admitted for a large abscess under the chin following impetigo. A sudden illness developed in hospital, with high fever, vomiting, and complete paraplegia in 24 hours. This was followed 48 hours later by loss of vision in one eye and 24 hours after in the other. The outline of both discs was blurred, but there was no definite neuritis. After three months the motor and sphincter paralysis was still complete and sensation greatly impaired, and all reflexes were absent, both superficial and deep. Both optic discs were pale, with clearly defined margins, but vision had greatly improved and she could read large print. Diagnosis: Myelitis of septic origin, involving the lumbar enlargement, and post-papillitic neuritis followed by atrophy, a very rare complication. 2. Paraplegia of the ordinary type in a female, aged 22 years. The onset was irregular, without fever. Diagnosis: Transverse dorsal myelitis (? specific). 3. A man, aged 22 years. Onset acute, with fever, headache, and vomiting. This was followed in from 12 to 24 hours by loss of power in the leg, not complete, and affecting some groups of muscles more than others—e.g., the extensors of the thigh and the peronei. Wasting was rather rapid and the response to the faradic current lessened, being about equal to that of the constant current. The sphincters were unaffected and sensation was normal. The knee-jerk was abolished, there was no ankle clonus, and the other reflexes were normal. Diagnosis: anterior poliomyelitis in the adult of the paraplegic type. Dr. Hobhouse also showed a case of the spleno-myelogenous variety of Leucocythæmia in a female, aged 40 years, of two or three years' duration. The remarkable feature in this case was the sudden drop in the number of leucocytes from 173,000 to 6000 and subsequently to 1600, with a complete alteration in the blood picture. The myelocytes dropped from 22·0 to 2·0, whilst the mast cells increased in about the same proportion, small lymphocytes also rising from 7·5 to 26. The general condition of the patient improved considerably, but there was little, if any, alteration in the size of the spleen, which filled half the abdomen. The treatment was first the injection of soamin three times weekly, which at the time seemed to have no effect, followed by the administration of liquor arsenicalis in increasing doses till 10 minims three times daily were being given. This was discontinued on the progressive fall of the leucocytes and iron substituted.—Dr. Donald G. Hall showed a case of Leontiasis Ossea in a woman aged 72 years. The characteristic changes were present in the bones of the face, and the new bone had invaded the nasal and oral cavities. The patient also showed great thickening of the femora, tibiæ, and fibulæ. The probable pathology in this case was a progressive osteitis due to tertiary specific disease. Photographs and skiagrams of this patient were shown. Dr. Hall also showed a man, aged 46 years, suffering from Pulmonary Osteo-arthropathy, secondary to bronchiectasis of long standing, and two cases of Insular Sclerosis, the first in a man, aged 32 years, with a two years' history of difficulty in walking. This patient had temporarily improved to a marked extent. The second example was in a woman, aged 32 years, with a history of six years' duration, and exhibiting all the symptoms of the disease in a much more advanced stage.—Dr. C. F. Bailey showed a case of well-marked Keloid of the Face and Hand following burns.—The following specimens were exhibited.—Dr. Dill: A Stomach showing a large Malignant Ulcer, which had perforated a vessel causing profuse melæna.—Mr. R. F. Jowers: A specimen of Twisted Ovarian Cyst from a child aged 10 years, which had given rise to symptoms simulating appendicitis. He also showed a Gall-bladder which he had removed for primary carcinoma.—Dr. Hobhouse: A Blood Film from a case of Spleno-medullary Leukæmia, showing polymorphs, myelocytes, and mast cells; also a Liver from a case of Cirrhosis in a girl aged 20 years. The liver was embedded in a mass of adhesions of perihepatitis. There was multi-lobular cirrhosis and very little normal liver tissue. A microscopic specimen of the same was exhibited.—Mr. Fletcher: A specimen from a case of Malignant Ulcer of the Stomach, spreading from the duodenum for one and a half inches and causing no symptoms; also a specimen of Sarcoma of the Penis, with microscopic slides of the same and of the secondary growths in the glands. It was a mixed spindle and round cell growth, originating in the corpus cavernosum, and was covered by normal epithelium.—Dr. E. F. Maynard: A photograph and specimen of a Glandular Mass from a case of Lymphadenoma.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on Nov. 25th, Dr. W. H. Cheetham being in the chair.—Dr. W. H. Maxwell Telling read a paper on Nodular Fibro-myositis, and pointed out its identity with so-called chronic muscular rheumatism, the underlying pathology of which was an inflammatory hyperplasia of the fibrous tissues with a certain amount of exudation. He drew attention to the neglect of this condition by English authors and insisted that the only curative treatment of these cases was massage. He quoted a number of cases which illustrated both the severity and protean manifestations of the disease as well as its amenability to treatment by massage properly and skilfully applied.—Mr. J. Stewart showed a specimen of Inverted Meckel's Diverticulum from a child, aged 5½ years, who was seen at the end of 78 hours suffering from signs of intussusception. On opening the abdomen gangrenous-smelling fluid escaped in large quantity. There was an enteric intussusception, which by coaxing was reduced with the exception of a small truncated mass inside the gut. This was seen to be a Meckel's diverticulum. An incision was made in the gut below this; it was drawn through the incision, tied and cut off, and the wound closed. The child died.—Dr. C. Oldfield showed a Fibroid Tumour of the Uterus of unusual appearance. It looked like adipocere; under the microscope the muscle outlines and nuclei could be seen, but staining was faint. Oöphorectomy had been done 17 years before; this did not relieve other symptoms than menorrhagia and distressing pain, and urinary symptoms had called for radical treatment. No change in the size of the tumour resulted from this oöphorectomy.—Mr. W. Thompson showed a Calculus removed from the Left Ureter at the back of the Iliac Crest. A plum stone was removed from the colon which was temporarily mistaken for the calculus in the ureter.—Mr. B. G. A. Moynihan showed a series of specimens from a case of Cholecystectomy, three of which illustrated a difficulty and a danger in the operation. In these three a portion of the hepatic duct had been removed with the gall-bladder. It was shown by reference to the specimens that a distortion of a distended hepatic duct might result from the cicatricial contraction of a gall-bladder, the seat of repeated inflammation. The gall-bladder became then broadly sessile, and in its pedicle the hepatic duct was drawn up. The defect could be remedied by suture over a catheter pushed upwards from the common duct.—Mr. J. F. Dobson showed a specimen of Meckel's Diverticulum and Peritonitis, with resection of the diverticulum, drainage, and recovery.—Dr. Telling showed a Factitious Dermatitis in a girl aged 18 years. By rubbing with a wet finger she had produced oval lesions about 1 inch to 1½ inches looking like patches of ordinary moist eczema. The distribution of these extended from below Poupart's ligament to the

dorsa of the feet and was on the anterior surface of the limbs. There were no other lesions. The first lesion appeared three months before. Since that date there had been one or two fresh lesions regularly every day, and the lesions were almost identical in size and shape and practically equidistant from each other. No treatment was adopted, the girl admitting that they were self-inflicted.—Cases and specimens were also shown by Mr. E. Hawkesworth Hackett, Dr. Alexander Sharp, Mr. H. Littlewood, Dr. T. Wardrop Griffith, Mr. G. Constable Hayes, Mr. H. L. Flint, Dr. J. B. Hellier, and Mr. Stewart.

HARVEIAN SOCIETY OF LONDON.—A meeting of this society was held on Nov. 24th, Dr. M. Handfield-Jones, the President, being in the chair.—Dr. Sidney P. Phillips read a paper on Fevers from the Standpoint of the Clinician. Dr. Phillips drew attention to the declining mortality from infectious fevers as evidenced by the Registrar-General's returns, and pointed out that this was partly due to a decreased incidence of these diseases and partly to a decreased case mortality. Speaking of rötheln, he considered there were many cases in which the rash did not appear before the third day, and gave details of cases in his practice in which feverish symptoms of an influenzal type had been present for a few days before the rash. In the differential diagnosis between this complaint and measles he laid stress on the value of Koplik's spots. He had known cases of measles being mistaken for small-pox owing to the shotty feeling of the rash when it first appeared on the forehead. He had also seen pityriasis rubra accompanied by fever simulating the rash of measles. Amongst the sequelæ of the affection he drew special attention to tuberculous peritonitis. In speaking of mumps he read notes of some very severe cases in which maniacal symptoms obscured the diagnosis; the testicle was generally affected in these cases. He advised mercury in the treatment of mumps owing to its well-known influence on the salivary glands. Typhoid was one of the fevers in which there had been a decline in the mortality, but in this case mainly due to diminished incidence, the case mortality remaining about the same. He recommended whey and citrated milk; the latter, however, did not prevent thrombosis as a sequela, contrary to his expectation. He gave small doses of calomel as an intestinal disinfectant; it was not contra-indicated by diarrhœa or melæna; he recommended sanitas enemata and thought cold bathing impracticable in private practice. He had seen several cases of typhoid fever complicated by pregnancy; in the early months they generally aborted, in the later went to full time. Speaking generally, he considered that hyperpyrexia as a complication of fevers was always due to some local cause such as pneumonia, rheumatic fever, and in typhoid fever, perforation, and such causes should always be sought for. The combination of two exanthems in the same patient was no uncommon occurrence in the fever hospitals, however rare it might be in private. The following took part in the discussion:—Dr. T. Hartigan; Dr. C. O. Fowler, who thought that the cases of rötheln in which rash appeared on the third day might be cases of influenza accompanied by rash—he also laid stress on the importance, where cold bathing was adopted in typhoid fever, of thoroughly skilful lifting of the patient into and out of the bath; Sir John Broadbent, who mentioned cases illustrating the non-infectivity of the pre-eruptive stage of scarlet fever and also advocated the calomel treatment of typhoid fever; and Dr. G. de B. Turtle, Dr. E. Graham Little, and Mr. Albert Kisch.

LIVERPOOL MEDICAL INSTITUTION.—A meeting of this society was held on Nov. 24th, Dr. T. R. Bradshaw, the President, being in the chair.—Mr. K. W. Monsarrat showed a patient suffering from Osteitis Deformans. The patient was 40 years of age and a photograph taken at about the age of 21 showed that he was then quite free from any disease of the bones. The bones of the legs were markedly thickened and bent outwards, and there was a similar deformity in the bones of the forearms. There had been progressive enlargement of the head and there was a prominent median boss over the frontal and parietal bones. The right clavicle was greatly thickened. Several fractures had occurred after slight injuries.—Dr. R. M. Manwaring-White mentioned a similar case which had recently been under his care.—The President suggested the possibility of late rickets.—Mr. R. E. Kelly briefly described Mayo's operation for Hallux Valgus. He showed that the condition was essentially one of a long great-toe, and necessitated the removal of a large portion of the head of the metatarsal bone so as to reduce it in length. He then described the ingenious use of the bunion or adventitious bursa in forming a new joint. The case was illustrated by X ray photographs of the foot.—Mr. T. R. W. Armour alluded to the great danger of sepsis in the bursa, and said that he had had many successes with the older methods of operation.—Mr. G. P. Newbolt also spoke in a similar sense, and laid stress upon the importance in some cases of dividing the tendon of the extensor hallucis.—Dr. A. A. Bradburne read a paper on Incipient Glaucoma, its Diagnosis and Treatment. He laid the greatest stress upon the importance of the diagnosis in the earliest possible stage, and discussed in detail the ophthalmoscopic signs. He considered its division into primary and secondary forms, and pointed out that the recognition of the disease depended upon a knowledge of the effects of hypertension; he then considered the effects of this upon the several parts of the eye and described the objective signs. Mr. Bradburne mentioned the difficulties of treatment, the great importance of medical and preventive treatment, and described a modification of the ordinary iridectomy which he was in the habit of performing, which consisted in drawing a small part of the iris forwards and inwards before detaching it.—Mr. A. Nimmo Walker considered Priestley Smith's modification of Bjerrum's test for incipient glaucoma to be of value, and he now used it in his routine examination of patients. He was experimenting with Schioetz's tonometer, which he thought had come to stay, as it was more scientific and trustworthy than digital palpation. In regard to operative measures, he did not do iridectomy, which in his opinion was unnecessary and often useless; in acute cases he did cyclotomy, and in chronic cases sclero-corneal trephining, although his experience of this operation was comparatively small. The results, as far as they went, were encouraging.—Dr. K. A. Grossmann said that the symptoms could not be considered as pathognomonic when they occurred alone. He instanced a case where, with an apparently marked glaucomatous cup, the vision was normal as regards colour, form, and field. He maintained that the cause of glaucoma was not yet found. Of operative methods the iridectomy proposed by Graefe 60 years ago still was the best, though no one could explain why it was beneficial. He advocated this operation with a wide basal incision.—Mr. T. H. Bickerton alluded to the great difficulty there might be in deciding upon the proper treatment in a given case.

MANCHESTER DERMATOLOGICAL SOCIETY.—At a meeting held on Nov. 12th in the Manchester and Salford Hospital for Diseases of the Skin, all the members of the staff being present, it was unanimously decided to form a Dermatological Society in Manchester.—Dr. H. A. G. Brooke was elected President of the society and Dr. William Dyson honorary secretary.—Dr. R. B. Wild showed: (1) Hyperidrosis of the Forearm following a Fracture; (2) two cases of Tuberculous Lymphangitis; (3) an anamolous case of Pityriasis Rubra Pilaris with Ichthyosis; and (4) Morphœa.—Dr. G. H. Lancashire showed: (1) Lupus Vulgaris simulating Lupus Erythematosus; (2) Papular Eruption of the Neck of a man aged 24 years (for diagnosis); (3) Tuberculous Ulceration of the Upper Lip; and (4) Lupus Vulgaris, discrete nodules scattered over the face, with marked erythema and œdema.—Mr. L. Savatard showed: (1) Multiple Fibro-neuromata, with thickened cutaneous nerves; (2) Papular Tuberculide of the Face, which had cleared up after an attack of erysipelas; and (3) an extensive case of Lupus Vulgaris, which had remained well for several years.

COLONIAL MEDICAL SERVICE: WEST AFRICAN MEDICAL STAFF.—Mr. W. S. Snell, medical officer, Southern Nigeria, has retired from the service, and Dr. F. M. Simmonds, medical officer, Gold Coast, has resigned with a gratuity. Mr. W. H. G. H. Best and Dr. C. R. Chichester, senior medical officers, Southern Nigeria, have been promoted to Provincial Medical Officers. Mr. H. C. Jeffreys, formerly a medical officer in British Honduras, has been selected for appointment to the Staff and posted temporarily to Sierra Leone.

Reviews and Notices of Books.

Die Wassermannsche Reaktion, mit besonderer Berücksichtigung ihrer klinischen Verwertbarkeit. (Wassermann's Reaction, with Special Consideration of its Clinical Application.) Von Priv.-Doz. Dr. HARALD BOAS, I. Assistenten am Rudolf Berghs-Hospital für venerischen Krankheiten in Kopenhagen. Mit einem Vorwort von Geh.-Rat. Professor Dr. A. WASSERMANN. Berlin: S. Karger. Pp. 186. Price, paper, 5.60 marks; bound, 6.80 marks.

THE striking results of research upon the cause, diagnosis, and treatment of syphilis during the past five years when considered together afford one of the most notable instances of the rapid advances yielded to practical medicine by the application of scientific experimental methods. The successful inoculation of the disease upon apes by Metchnikoff and Roux in 1903, the discovery of the spirochæta pallida by Schaudinn and Hoffman in 1905, the evolution of Wassermann's serum test in 1906, and the remarkable work upon the treatment of the disease by Ehrlich and Hata during the present year by means of dioxydiamidoarsenobenzol, or "606," form a series of epoch-marking advances which are fresh in the minds of all. These observations are to some extent interdependent and complementary, which no doubt partly accounts for the great rapidity with which they have followed one another. Although there are many details which are yet obscure and require further investigations, systematic and laborious in nature, for their elucidation, it is perhaps not too much to hope that the final outcome will be to remove the diagnosis and treatment of syphilis from the realms of speculation and empiricism and to place them upon an assured scientific basis.

The diagnostic serum reaction, which is now generally known as Wassermann's reaction, was first published in the *Deutsche Medizinische Wochenschrift* of May 10th, 1906, by Wassermann, Neisser, and Bruck. It is in principle an application of the general phenomenon of deviation or fixation of complement, first described by Bordet and Gengou in 1901, a fact which is perhaps less generally known than it should be. Since its first introduction Wassermann's reaction has been the subject of a very large number of researches by workers all over the world, and it has been modified in various ways, some of these modifications showing very marked differences from the original method. Consequently the literature of this subject alone is very considerable, and the statement that a given individual is the subject of a positive Wassermann reaction is often one that requires amplification before its exact value can be appraised, since the different modifications yield results of varying degrees of specificity as judged by the statistics of those employing them. A critical and authoritative consideration of the whole question is therefore desirable. This is afforded in the book before us, which has a highly commendatory preface written by Professor Wassermann himself, stating that the conclusions arrived at by Dr. Boas are in complete accord with the observations made in Professor Wassermann's own laboratory.

Dr. Boas first gives an interesting historical review of the observations upon this subject up to the present time, and explains very clearly the general principles of the method. He describes the modifications which have been introduced, and reviews the chief results obtained by various observers, referring briefly to some of the chief explanations offered of the phenomena. The technique of the reaction is then very carefully and fully described. The essentials, as in any instance of the Bordet-Gengou reaction, are an amboceptor, complement, blood corpuscles, antigen, and the serum of the patient. The first three comprise what is now generally known as a hæmolytic system, and the last two are the factors which serve to deviate or fix the complement, thus preventing hæmolysis and affording the visible basis of the reaction. The amboceptor used by Wassermann and also by Boas is the serum of a rabbit immunised for sheep's corpuscles, and inactivated by warming to 56° C. for half an hour. For complement fresh guinea-pig's serum is employed. The blood corpuscles used in the test are those of the sheep in a 5 per cent. dilution. The original antigen used by Wassermann and his co-workers was an extract of some syphilitic organ. The antigen generally employed by Dr. Boas has been an alcoholic extract of human heart, not necessarily from a syphilitic person, since it has been repeatedly shown that other substances than syphilitic extracts, such as lecithin, sodium taurocholate, &c., can act as effective antigens. The serum from the patient is derived from blood drawn from the ear or from a small vein. This should not be done in direct sunlight, and the serum should be inactivated as soon as possible by heating to 56° C. for half an hour. The mode of carrying out the reaction, including the titration of the amboceptor and of the complement, the preparation of the various dilutions and of the necessary controls, is described most clearly, and a method of quantitative recording of the results is outlined. Some of the numerous modifications of and substitutes for Wassermann's reaction are referred to, and Dr. Boas comes to the conclusion that the original reaction is the most satisfactory.

In order to appraise the value of the reaction Dr. Boas has carried out a large number of control observations upon diseases other than syphilis, especially upon those in which it has been affirmed by other observers that a positive reaction occurs. In scarlet fever it was stated by Much and Eichelberg that a positive reaction was found in 10 out of 25 cases. Dr. Boas finds that the reaction is occasionally present but that it is very transitory, and that its occurrence does not lessen the value of Wassermann's reaction. In cases of pulmonary tuberculosis, pneumonia, malignant growths, typhoid fever, and diabetes mellitus, in all of which a positive reaction has been described by other investigators, Dr. Boas obtained almost invariably negative results. In malaria positive reactions occasionally occur, in leprosy the tuberculous form often gives a positive reaction, the anæsthetic form but rarely does so. Similar positive reactions have been described in frambœsia and in relapsing fever. Dr. Boas records 1064 control observations on normal individuals and on cases of other diseases than syphilis, and of these only one case—one of scarlet fever—gave a positive reaction. He therefore concludes that in countries other than tropical ones Wassermann's reaction is specific for syphilis.

A careful analysis of the significance in regard to diagnosis and treatment of a positive Wassermann reaction in cases of syphilis and of the various parasyphilitic conditions is given by Dr. Boas. With a doubtful primary sore, an absence of the reaction is not a proof of its being non-syphilitic, nor is a positive reaction indicative of anything more than that the patient is the subject of syphilis. In the secondary stage, the positive reaction is constant in cases which have not been treated, but it may be wanting occasionally in fresh outbreaks of secondary symptoms in cases which have been under treatment. Similar statements are made in regard to the tertiary stage, and in general it is maintained that the reaction is far more marked in cases which have not been treated than in those that have. In regard to latent syphilis, only a positive reaction can be taken as possessing any diagnostic value. It is stated that the occurrence of a positive reaction after treatment is an indication that a recurrence of symptoms will speedily occur, or, as Professor Wassermann

expresses it in the preface, a persistent positive reaction in a syphilitic person indicates the presence of spirochætæ in his organism. In general paralysis of the insane a positive reaction with the serum occurred constantly; it was also obtained with the cerebro-spinal fluid in 91 per cent. of the cases investigated. In tabes dorsalis all cases previously untreated by antisyphilitic drugs gave a positive reaction. Dr. Boas is careful to urge caution in the interpretation of a negative reaction, both in regard to diagnosis and prognosis of syphilis. He claims that the reaction is a valuable addition to our means of studying syphilis, and he suggests that it will find useful applications in forensic medicine, in the examination of wet-nurses, and in the investigation of candidates for life assurance who have had syphilis. This book affords an admirable analysis of the practical results of Wassermann's reaction, and, being furnished with a very extensive bibliography, should be of value both to bacteriologists and clinicians.

Spondylo-therapy: Spinal Concussion and the Application of Other Methods to the Spine in the Treatment of Disease. By ALBERT ABRAMS, A.M., M.D. Heidelberg, Consulting Physician to the Mount Zion and French Hospitals, San Francisco. Illustrated. San Francisco: The Philopolis Press. 1910. Pp. 400. Price $3 50.

A QUOTATION from the author's preface is the readiest way of expressing the point of view of this book. "The subject of spinal therapeutics has received less attention from the medical profession than it deserves. Even the laity know that cold applied to the back of the neck may arrest hæmorrhage from the nose, and that heat applied to the small of the back may hasten menstruation. The profound and far-reaching physiologic truths which underlie these simple phenomena have either been ignored or only given inconsiderate attention. ..... One of the author's truest motives has been to lift this whole subject of spinal therapy out of the low state in which it blunders onward, hitting or missing as the case may be, and rescuing it from the lowly esteem which physicians as a class have thus felt for it. He has endeavoured to put it in a place befitting its scientific importance, and to emphasise its great practical helpfulness in disease."

After a brief historical retrospect and an anatomical and physiological introduction, the author proceeds to discuss the subjective and objective symptomatology of affections of the back and to give a summary (by no means comprehensive) of spinal diseases and symptoms, from "litigation back" to "vertebral insufficiency." He then passes on to general spondylo-therapy, which includes acupuncture, counter-irritation, electro-therapy, exercises, hydro-therapy, psychro-therapy (freezing), thermo-therapy, and vibratory massage. Some of these are, in the author's opinion, much more serviceable than others; he assigns paramount importance to percussion, sinusoidalisation, and psychro-therapy.

Even allowing for the venial enthusiasm of the specialist, we admit a sense of astonishment, if not of bewilderment, at some of the author's methods and apparent results. His contention is, in a word, that certain "vertebral reflexes" can be elicited by tapping various vertebral spines. These "reflexes" consist in modification of the form and position and secondarily of the function of certain of the viscera, such as the heart, lungs, spleen, intestines, aorta, and bronchi. In addition, however, certain cutaneous and muscular phenomena can be produced by similar methods. When, then, we suspect disease, functional or organic, of any particular viscus or viscera, or of any system such as the vaso-motor, or when we are confronted with any sort of pain or neuralgia or paræsthesia, we must seek out the corresponding spinal segment or segments, thence the corresponding "spinal window" (point of exit of spinal root), and attempt to influence the latter by percussion, freezing, or sinusoidalisation. For erythromelalgia, acrodynia, aortic aneurysm, migraine, exophthalmic goitre, diabetes mellitus, coryza, cold extremities, vaso-motor symptoms of the neuroses, vascular hypertension, and certain toxic conditions—this is the author's inclusive list—he taps the spine of the seventh cervical vertebra. For asthma he applies the sinusoidal current over the fourth and fifth cervical vertebræ; for vascular hypotension, the four lowest dorsal vertebræ; for nervous diarrhœa, peristaltic unrest, entero-spasm, constipation, and meteorism, the eleventh dorsal spine; for hepatic toxæmia, the first three lumbar spines, and so on.

Some of the clinical records supplied by the author are startling enough and border on the incredible; for while the rationale of the method can be appreciated within certain limits, both experimental and clinical corroboration is required of much that is stated baldly if not tacitly assumed. Dr. Abrams frankly allows that his book is a pioneer effort and asks that it be judged as such.

American Practice of Surgery: A Complete System of the Science and Art of Surgery by Representative Surgeons of the United States and Canada. Editors: JOSEPH D. BRYANT, M.D., LL.D., and ALBERT H. BUCK, M.D., of New York City. Complete in eight vols. Profusely illustrated. Vol. VII. New York: William Wood and Company. Pp. 761. Price $7 per volume.

THE appearance of the seventh volume tells us that this great System of Surgery is drawing to a close. It contains much that is of interest, especially as it deals in great part with the surgery of the abdomen. The first section is by Dr. C. H. Peck of New York City, and treats of the surgical conditions of the pelvic and gluteal regions. In this the most important subject dealt with is the congenital sacro-coccygeal tumour. In a chapter entitled "Surgical Diseases of the Extremities" Dr. C. A. Porter and Dr. William C. Quinby of Boston, Massachusetts, have described those minor disorders which do not naturally fall into any of the other chapters of the work. Thus we find an account of X ray dermatitis, ingrowing toenail, subacromial bursitis, paronychia, and many similar affections. These are just the conditions which so often are omitted in elaborate treatises on surgery, and we are glad to see they have been dealt with adequately here. It is a useful chapter, and we agree with the treatment advised. On one point we should like an explanation. For hæmatoma of the quadriceps femoris the following treatment is given: "The patient should be kept at rest in bed for the first few days, and baking and moderate bandaging should be employed." We do not understand what is meant by "baking."

Surgical diseases and wounds of the abdominal wall have been dealt with by Dr. J. D. Griffith of Kansas City, who contributes an interesting account of desmoids of the abdominal wall, illustrated by two excellent coloured plates. In a chapter on the diagnosis of tumours of the abdomen Dr. Malcolm L. S. Harris, of Chicago, has described, as fully as the few pages allotted to him will allow, this difficult subject, but we think it would have been well to have allotted more space to it. In a chapter on abdominal section, by Dr. W. M. Mastin of Mobile, Alabama, the author discusses the site of incision and the mode in which incisions should be made. The question of drainage is also considered and the objections are mentioned, but we think that hardly sufficient stress is laid on the risks of the drain forming a channel by which the peritoneum may become infected. Some useful instructions are given for

the preparation of the patient for the operation and for the after-treatment.

The very important modern subject of the surgery of the pericardium and heart has been dealt with by Dr. R. G. Le Conte and Dr. F. T. Stewart of Philadelphia. The anatomical considerations are described; the authors recommend that the safest point for puncturing the pericardium is the fifth interspace close to the left edge of the sternum; they describe many of the incisions which have been recommended for exposing the heart and in discussing the relative merits of these they maintain that no definite plan can be laid down for all cases. The situation of the wound, the condition of the pleural cavity, and the degree of certainty of the diagnosis must influence the incision made. The subject of the arrest of hæmorrhage is fully considered. The suture of arteries and their anastomoses are also well described, and in the same chapter we find an account of the treatment of aneurysm.

Dr. A. J. Ochsner of Chicago has written on the surgical diseases of the stomach and œsophagus. The section occupies more than 100 pages and is almost a treatise by itself. The various methods of performing gastro-enterostomy and gastrostomy are described; the account is well illustrated, and a good description is given of the surgery of the œsophagus, but we cannot help thinking that some of the methods of dilating strictures of the œsophagus which are described are hardly worth the space allotted to them. Although many of them are exceedingly ingenious, the cases in which they are applicable are very few, and their value has yet to be proved. Dr. J. Charles Reeve, junior, of Dayton, Ohio, has contributed the section on the surgery of the diaphragm and subphrenic abscess. It is seldom that these subjects are described so thoroughly as here; the importance of subphrenic abscess is very great, and we are pleased to see that it receives this degree of attention.

Dr. A. J. McCosh of New York City has written on the surgical treatment of septic peritonitis. In describing the use of saline solution for irrigation of the peritoneal cavity we think it would have been as well to have mentioned how this solution should be made; it is not sufficient to say, "Salt solution in physiological strength." Tuberculous peritonitis has been discussed by Dr. Nathan Jacobson of Syracuse, New York. The author considers that the best results from operations for this affection are obtained when manifestations have become stationary. Dr. E. Wyllys Andrews of Chicago, Illinois, has contributed the article on hernia. He describes fully his original method of radical cure of inguinal hernia, and his method appears to have been the first in which overlapping of the cut edges of the fasciæ was considered of importance. Dr. McCosh has also written the chapter on diseases of the appendix, which represents the current views on this important subject, and it is especially good in that part which deals with the analysis of the symptoms which may be present with appendicitis. Dr. C. W. Oviatt of Oshkosh, Wisconsin, has contributed the section on the surgery of the intestines, omentum, and mesentery. It is well illustrated. The account of colostomy is hardly sufficiently detailed.

Dr. J. P. Tuttle of New York City, and Dr. S. T. Earle of Baltimore, have described the surgery of the anus and rectum, and they have acted wisely in commencing their articles with an account of the anatomy of this region. This article occupies nearly 200 pages, and is as satisfactory as the names of its authors would suggest. The authors speak very highly of the perineal operation for removal of malignant disease of the rectum, and they advise that whenever a rectal tumour cannot be removed by the perineal method it should be treated either by the abdominal method or the combined method. In this section we have a very satisfactory account of appendicostomy.

Technical Mycology: The Utilization of Micro-organisms in the Arts and Manufactures. By Dr. FRANZ LAFAR. Translated by CHARLES T. C. SALTER. Vol. II., Eumycetic Fermentation. Part II., with 50 figures in the text. London: Charles Griffin and Co., Limited. 1910. Pp. 748. Price 18*s.* net.

THIS publication completes a series of three volumes upon a very interesting and important subject. The publication of the concluding number with index has been considerably delayed owing to a difficulty in obtaining the final sheets from the German publishers. Seven years have, in fact, elapsed since the previous volume was issued, a review of which appeared in our columns of July 11th, 1903, p. 104. This delay has perhaps not been without its advantages, as, for one thing, it has given the author an opportunity of bringing his materials into line with modern contributions. The importance of the subject grows rapidly day by day, for great departments of industry depend for their success upon an accurate knowledge of the life-history and habits of micro-organisms. The author possesses an intimate knowledge of the subject gained largely from the fact of his occupying the position of professor of fermentation-physiology and bacteriology in the Imperial Technical High School at Vienna, and he may be congratulated upon the completion of a work which, so far as we know, is the only compilation of its kind. In this he has had the advantage of the assistance given by some distinguished German authorities on the significance of fermentations. The volume before us contains five important sections of the subject of eumycetic fermentation, which are dealt with in the following order: Section XIII., Yeast Nutrition and Yeast Culture; Section XIV., Life-history and Variability of the Saccharomycetes, with a Classification of Saccharomycetes and Schizosaccharomycetes; Section XV., Morphology and Classification of Certain Technically Important Higher Ascomycetes and Allied Forms; Section XVI., General Morphology, Physiology, and Classification of Technically Important Budding Fungi of the Group "Fungi Imperfecti"; and Section XVII., the Enzymes and Enzymic Actions of Yeast. A consideration of these headings will indicate what an important number of technical applications are involved. To mention a few, the great brewing industry would soon bring disaster upon itself if care was not taken to select a healthy race of yeast; the manufacture of cheese is rapidly becoming a standardised and healthy process by paying attention to the habits of the organisms concerned in its production; the quality of tobacco, again, is largely a matter of organism activity; thousands of butts of wine have been spoilt by disregarding the exact conditions under which the organised activities convert the juice into wine; and oftentimes the grape harvest might have been saved from ruin if only preventive measures based on a knowledge of the nature of the attacks of disease had been applied. In short, there is a pathology of art and industry which, when it comes to be studied in all its details, promises to lead to a handsome reward in the shape of an assured yield of produce of a uniform wholesome character. The labours which help this movement forward need no commendation from us; we regard Professor Lafar's work as invaluable alike to the student and to the practical man.

Allen's Commercial Organic Analysis. Vol. III. Edited by W. A. DAVIS, B.Sc., A.C.G.I., and SAMUEL S. SADTLER, S.B. London: J. and A. Churchill. 1910. Pp. 635. Price 21*s.* net.

WITH each succeeding volume the reader of the original "Allen's Commercial Organic Analysis" will recognise the gradual insertion of the work of new hands and the disappearance of the school of the old master and his pupils. For our part we are sorry that some effort was not taken to

preserve the style and method of treatment outlined by the original author. As it is, the work is rapidly approaching a shape in which all traces of the original design are lost, and somehow there was an attractive personality about Allen's work which is missing in the new edition. He wrote his work, we may say, in the laboratory, for every paragraph appeared to be the result of practical personal experience gained at the bench, and when the laboratory student wanted information on experimental points he invariably found it—he was led straight to a trustworthy test, and was warned of fallacies which might arise in connexion with it. Mr. Allen, of course, took a strong practical interest in analyses relating to foods and medicines, and his experience on these points was valued; and we think we are right in saying that it was on account of this experience that his work enjoyed a considerable reputation. "Commercial Organic Analysis" is, however, a wide title, and we are not surprised that the technological or industrial side of the subject has demanded development. The present volume, for example, is almost exclusively technological or industrial, if we leave out the section on aromatic acids, in which certain drugs (e.g., oil of bitter almonds, tolu, and storax) have clearly to be discussed, and the salicylates in their rôle as preservatives of food. The rest of the chapters deals with hydrocarbons, bitumens, naphthalene and its derivatives, anthracene and its associates, phenols, aromatic acids, gallic acid, phthalic acid, and modern explosives. There is no relief from technology here, and the editors acknowledge their indebtedness to four technological chemists in America connected with coal and iron works, tar distilleries, and asphalt production. Dr. Leffmann has ceased to continue as American editor owing to pressure of work elsewhere, and he is succeeded by Mr. Samuel S. Sadtler of Philadelphia, who is responsible for the articles on bitumens, anthracene, and phenols. The subsection of the chapter on phenols dealing with phenolic disinfecting liquids is disappointing in analytical particulars, having regard to the considerable attention which this subject has received within recent years. On the other hand, in the section on aromatic acids there is recent and useful information relating to the detection and estimation of antiseptics in food.

There are yet five volumes to come, and a glance down the synopses of these shows that we may confidently expect a very interesting series of monographs written by a well-recognised authority in each case.

LIBRARY TABLE.

Bier's Hyperemic Treatment, in Surgery, Medicine, and the Specialties: a Manual of its Practical Application. By WILLY MEYER, Professor of Surgery at the New York Post-Graduate Medical School and Hospital, and Professor Dr. VICTOR SCHMEIDEN, Assistant to Professor Bier, University of Berlin. Second revised edition, enlarged. Illustrated. London and Philadelphia: W. B. Saunders Company. 1909. Pp. 280. Price 13*s.* net.—The value of the treatment introduced by Bier has received throughout the world due recognition, but there are still many who are not conversant with the methods of application of the treatment and who would be willing to employ it if they knew how to apply it. As was natural with a new method of treatment, somewhat extravagant claims were made at first by some of the exponents of the Bier treatment, and an entirely undeserved opprobrium which in some cases followed was due to the unintelligent application of the method. It is, therefore, in the mode of application of Bier's treatment that the great need for instruction exists, and we are glad to see that the exposition by Professor Willy Meyer and Dr. Victor Schmeiden has reached a second edition. It contains the information required in a more easily assimilable condition than do the original writings of Bier, and, moreover, it contains later applications of the method than are to be found in any other work. The book is well worthy of careful study by those who are only imperfectly acquainted with the subject, while a valuable bibliography concludes the volume.

Manuel de Neurologie Oculaire. Par F. DE LAPERSONNE, Professeur de Clinique Ophtalmologique, et A. CANTONNET, Chef de Clinique Ophtalmologique à la Faculté de Médecine de Paris. With 106 figures. Paris: Masson et Cie, 1910. Pp. 368. Price 6 francs.—The ever-growing specialty of ophthalmology is divisible into three branches—optic, surgical, and medical. The compactly and lucidly written volume before us is concerned solely with the third of these divisions, and commends itself alike to the oculist and the neurologist. Nor ought the limits of its serviceableness to be thus confined, for owing to an excellent index—a feature that does not characterise all the volumes produced by our continental *confrères*—it may be regarded as a dictionary of clinical ophthalmology wherein the general practitioner will find references to any symptom of an ocular or visual nature that he is likely to be confronted by. The first part of the book is analytical, and consists of an anatomical description of the different systems of the eye, motor, sensory, visual, vaso-motor, and secretory, each of which is followed by a corresponding description of the physiology, and finally of the physiological pathology, of the system. Thus there is no structure, peripheral or central, no function, simple or complex, no symptom of low or high level, that is not adequately considered. A medical review *d'ensemble* of this kind is not readily accessible in ordinary text-books, and the authors deserve hearty congratulations on the way in which their task has been performed. The second part of the book is synthetic: ocular and visual affections in diseases of the nervous system, the digestive, respiratory, circulatory, and genito-urinary systems are fully and concisely set forth, as also in various intoxications and infectious diseases. We can cordially recommend the volume to all who are interested in the scientific side of the subject, as well as to any who merely desire a work of reference for ocular or visual symptoms.

A Prescriber's Companion. By THOMAS D. SAVILL, M.D. Lond. Fourth edition. Revised by the Author, assisted by CHARLES F. HARFORD, M.A., M.D. Cantab., Principal of Livingstone College. London: Henry J. Glaisher. 1910. Pp. 59. Price 1*s.* net.—This little book contains a large number of convenient prescriptions, a list of the doses of the more important drugs, directions for preparing fomentations and baths, and many other things likely to be of use to the busy practitioner. The section on serum and vaccine therapy, though brief, is likely to prove useful; it was entirely rewritten by Dr. Savill within a few weeks of his death. Not the least valuable section is that dealing with the antidotes of the more common poisons.

The Science of Happiness. By HENRY SMITH WILLIAMS, M.D., LL.D. London and New York: Harper and Bros. 1910. Pp. 350. Price 7*s.* 6*d.* net.—We welcome the increasing popularity of the doctrine that the moral life, with its self-knowledge, self reverence, and self-control, is a sure high road to happiness. It is of good augury when the youth of a nation are taught that virtue is not a continual painful struggle after the unattainable, but rather the obedience to hygienic laws of life, which brings its own reward in lifelong happiness. The volume under review should have a wide circulation, because Dr. Smith Williams preaches healthy-minded obvious common-sense. His illustrations from physiological laws of health are just and practical, his examples from history are apt and to the point, he has not weighted his matter with descriptive methods culled from Yogi

practices or mystic auto-suggestive repetitions of absurd phrases. He discusses his subject under four headings—(1) the physical aspect of happiness, which involves obedience to laws of health; (2) mental (education of the memory and reason); (3) social; and (4) moral. He resembles his compatriots in that he advises the frank pursuit of material success. Time alone will show whether this modern philosophy will stand the test of the suffering and the pain and the self-sacrifice which the wisdom of the ages tells us are real and which have proved in the past to be the cleansing fires necessary for the highest growth of the human character.

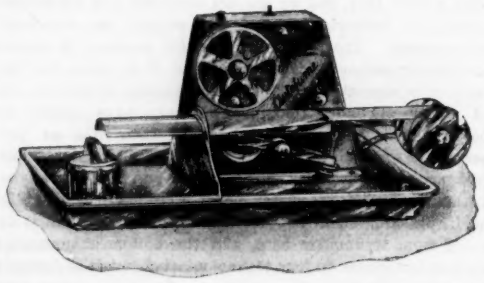
Science German Course. By E. W. PAGET MOFFATT, M.A. Lond., M.B., B.C. Camb. Second edition, enlarged. The University Tutorial Series. London: W. B. Clive. 1910. Pp. 243. Price 3*s.* 6*d.*—In noticing the first edition of this book we were able to speak very favourably of it, and this second edition is an improvement even on the first. A number of extracts from scientific works have been added, and we are glad to see that the small error we pointed out has been corrected. The importance of German as a language for all who study science can hardly be over-estimated, and no student can wish for a better introduction to scientific German than is provided by this book.

Fly-leaves from a Fisherman's Diary. By Captain G. E. SHARP. London: Edward Arnold. Pp. 175. 1910. Price 5*s.*—Fishing as a recreation is so much in vogue among medical men that in recommending this little book in our columns we are addressing many who know already how to throw a line and are sensible also to the keen yet soothing delights of the art. Captain Sharp's book is not a guide to the beginner; it appeals to those who are able to criticise the methods of a dry-fly man, but who yet are not above taking practical hints from one who is an expert in the process of getting fish, which some men who fish a great deal are not. It is an impulsive book, written obviously because the writer felt that it was almost his duty to try to communicate to others some of the "golden glamour which surrounds fishing as it does no other sport"; and being written in this spirit Captain Sharp becomes a successful author. In his little idyll he bubbles over with love for the country and all that dwells in it, and lights up the common elements of the river-side, which might otherwise pass unappreciated, with a spirit of phantasy. We assume that Captain Sharp is no poacher, but he is most humanly alive to all the devices of the illegitimate brotherhood; he fishes also in the spirit of the sportsman, with proper self-abnegation in restoring to its natural element the trout which, after a regretful caress, he finds to be below the standard regulation. Would that all sportsmen were equally conscientious! The book is furnished with some pretty photographs of the river and its surroundings by Mr. Parker.

New Inventions.

THE "AUTOFUME."

THIS is a very ingenious apparatus designed for the relief of certain respiratory disorders, and particularly asthma. The use of the "autofume" assumes that the fumes of a medicated paper affords relief to the patient, and the apparatus supplies the sedative fumes automatically and at regular intervals by means of a clockwork "feed." A glance at the accompanying illustration will make the working of the apparatus clear. A clock regulates the movement of the medicated paper between a spool on the right hand side of the apparatus and a night-light on the left side, which is of a special kind, and is provided further with a safe holder. When the paper comes into contact with the flame of the night-light a fume is thrown off, the character of which may be prescribed by the medical man according to the special needs of the patient. The paper burns regularly and uniformly like ordinary "touch paper." The combustion of the paper takes a few seconds and then a lapse of so many minutes follows according to the adjustment which has been made. The speed of the apparatus can be varied according to the size of the room and to the requirements of the patient. Two driving wheels are provided with each machine. One wheel has three spaces cut in the rim and when running at fast speed the paper takes 7½ minutes to reach the flame, burning 12 inches of paper in one revolution, while at slow speed 15 minutes are occupied in the paper reaching the flame. The



other wheel has two spaces cut in the rim, and when running at fast speed the paper takes 7½ minutes to reach the flame, then rests for 4½ minutes, and when running at slow speed the paper takes 15 minutes to reach the flame and rests again for 9½ minutes, bringing 8 inches of paper through in one revolution, or one-third less paper than with the other wheel. It is stated that the machine will work for a full nine hours if required, or it can be put out of action at any moment and restarted again just as quickly. The apparatus which we examined was submitted to us by Messrs. Arnold and Sons of 26, 30, and 31, West Smithfield, E.C., and the "autofume" was invented by an engineer who suffered severely with distressing asthmatic spasm.

WECHSELMANN'S APPARATUS FOR THE INJECTION OF "606."

THE complete success of the use of "606" depends in no small degree on attention to the technique. Already many methods of injecting "606" have been employed, and that devised by Wechselmann has been widely used. The apparatus for employing this method has been made by Messrs. Hirsch and Co., of 18, Lindower Strasse, Berlin N.39, and 236, High Holborn, London. The mode of using the apparatus is as follows. "606" is dissolved by grinding with 1–2 c.c. caustic soda in an agate mortar. A few drops of glacial acetic acid are added to produce a yellow paste, which is thinned by addition of distilled water and exactly neutralised to litmus paper by means of 1 per cent. acetic acid or 0·1 per cent. normal caustic soda. The resulting suspension is taken up by means of a pipette and introduced into the sterilised tube of a centrifuge. After rotation in the centrifuge, the tube is removed and the upper liquid poured off. The yellow deposit remaining in the tube is agitated with physiological saline solution and poured into a porcelain basin from which it can be drawn through the cannula into the syringe. The required amounts of distilled water and physiological saline solution should be *poured* out from the bottles into the two porcelain dishes. It is not advisable to insert the pipette into the liquids in the stock bottles, as, having once been in contact with the yellow paste, it is naturally apt to make the liquids turbid.

THE LANCET.

LONDON: SATURDAY, DECEMBER 10, 1910.

Pellagra Investigation.

IN the early part of the present year a committee of pathologists and epidemiologists was formed for the purpose of investigating the causation of pellagra,[1] and at a meeting in February it was resolved that Dr. L. W. SAMBON'S hypothesis—viz., that the disease was possibly due to a protozoal organism gaining access to the human body by means of some biting fly—should be investigated; an appeal was then made for the necessary funds. Dr. SAMBON proceeded to Italy in March, and recently presented an interim or progress report[2] on his researches. He claims to have established: (1) that pellagra is not due to the eating of maize, either sound or deteriorated, as hitherto almost universally believed; (2) that it has a striking, peculiar, and well-defined topographical distribution; (3) that its endemic foci or "stations" have remained exactly the same in many places for at least a century; (4) that its stations are closely associated with streams of running water; and (5) that a minute blood-sucking fly, of the genus Simulium, is in all probability the agent by which pellagra is conveyed. He has not been able to carry out the experimental work necessary to prove the agency of Simulium in the transmission of the disease, but has brought together a body of evidence sufficiently powerful, as he believes, to render it almost a certainty.

The various theories at present held as to the causation of the disease, generally connected with maize consumption, are stated, and dismissed as insufficient; there is no difficulty in this, because it is now known that the disease has been repeatedly observed in places where maize is neither grown nor eaten, and in persons who have seldom or never partaken of it. CASANA has stated this to be the case in Spain, and numerous instances are quoted by Dr. SAMBON from different provinces in Italy. It has, however, been claimed by the Italian supporters of the maize theory, the "zeists," that great benefit has resulted from the law of 1902, which (*inter alia*) prohibited the importation of damaged maize, and ordered that poor persons affected with pellagra should be given free meals for not less than 40 days twice a year. Professor G. SANARELLI, now Under-Secretary for Agriculture, reported in 1909 that the number of "pellagrins" within the kingdom had been reduced to barely 55,000 in 1905, showing a decrease of 17,000 in the previous six years; and that the deaths from this cause had fallen from 10,284 in the three years 1887–89 to 4649 in the three years 1906–08. Dr. SAMBON disputes the inference: there has certainly been a diminution in the general death-rate from the disease, but he points out that this has been in progress ever since 1898, long before the law was enacted. In Lombardy and Venetia, the two regions most affected, the number of pellagrins enumerated has dropped from 36,630 and 55,881 respectively in 1881 to 15,746 and 27,781 respectively in 1905. This is certainly a most remarkable and satisfactory improvement. But Dr. SAMBON points out that "one cannot exclude the intervention of new beneficial economic and social conditions known to all, which may have influenced the sanitary conditions of their populations" (these being Professor SANARELLI'S own words in 1907). On the other hand, in Umbria and the Marches there has been an increase from 872 to 4250 in the former region, and from 406 to 1436 in the latter; the disease is also extending in Tuscany and in Latium. Certain defects in administration are pointed out which would certainly seem to interfere considerably with any material improvement from the measures adopted. For instance, in the *locande sanitarie*, for the reception and feeding of patients, Dr. SAMBON states that in some not one-third of the inmates could be looked on as true pellagrins, and as a rule not one showed acute manifestations of the disease. As to the free issue of salt to poor pellagrins, Dr. SAMBON says that "it has not proved more effective in the prevention of pellagra than the capturing of birds."

Dr. SAMBON came to the belief that pellagra was a parasitic disease because of (1) the recurrence of the symptoms, notwithstanding removal from an endemic district; (3) its peculiarities of distribution and incidence; and (3) its symptoms, course, and morbid lesions. He considered it to be an insect-borne disease, because it is not contagious, cannot be accounted for on any food or water theory, is limited to rural districts, has special seasonal incidence (spring and autumn), and is practically restricted to one class of people—the field labourer. Some species of Simulium appeared to be the most likely carrier, affecting the same topographical conditions, and having the same seasonal incidence in the imago stage, and geographical distribution. Dr. SAMBON criticises the maps that have been published showing relative incidence of the disease, and asserts that they have been compiled from data not always comparable and often inaccurate. As a result of his own observations, he states that pellagra localities are, as a rule, "the narrower valleys of hilly and wooded country, trenched by swift-running streams infested with Simulium." He emphasises "streams of running water." Such, however, are not the conditions in the Landes of France, about Arcachon and elsewhere, where centres of pellagra have long existed. Dr. SAMBON also mentions its prevalence in the flat country about Padua, and in the Euganean Hills, a volcanic group noted for the scarcity of water. Later on he states that he invariably found pellagra to be present in "low, flat, or hilly, well-watered areas," but to be absent from "more or less massive mountainous areas."

Several points come out clearly from the report. One is the permanency of the endemic areas, as proved by records, there being practically the same disease distribution now as in past years; another is that towns are entirely exempt from the disease; a third is its practical limitation to field labourers, though occasionally found in prosperous farmers.

[1] See THE LANCET, Feb. 5th (p. 408), and Feb. 12th (p. 450), 1910.
[2] Progress Report on the Investigation of Pellagra. Bale, Sons, and Danielsson, 1910.

Although chronic in its course, pellagra is prone to recrudesce yearly, either in the spring or autumn or at both seasons; the earlier the warm weather sets in the earlier the pellagrous rash appears. With regard to contagiousness, most authors have denied it, and in Italy opinion is almost, though not quite, unanimous against it. According to Dr. SAMBON'S view, which agrees with the facts, the disease is not transmissible in places devoid of the insect carrier, but in endemic centres where Simulidæ are found it is highly infectious. As to the connexion with some species of Simulium, Dr. SAMBON has not been able to ascertain anything definite; neither has he or any other observer detected any parasite in the blood that might be considered the specific cause of the disease, which may be, as he suggests, some ultra-microscopical germ. It is the fact, however, that "*Simulium* is found, and abundantly found, in all pellagrous districts throughout Italy." We think that most will now admit that the maize theory is disposed of, and that Dr. SAMBON'S view furnishes, at any rate, a very good working hypothesis to go on in regard to preventive measures; meanwhile, hæmatology appears to be the field that requires to be worked over, as has been the case in malaria and sleeping sickness. Our acknowledgments are due to Dr. SAMBON for his zeal and labours in the field of preventive medicine, which indicate the direction of further advance.

Cranio-Cleido-Dysostosis.

IT is one of the most noteworthy facts concerning the development of much of the modern progress of anatomy, that a very great deal of what is most suggestive and helpful has come from the observations of clinicians, rather than from the investigations of systematic anatomists. The reason for this is not far to seek. The clinician in his study of the living, and in his comparison of long series of cases showing the effects of disease or the results of imperfect development, has gone back in his methods two centuries behind the modern specialised anatomist. He has returned to the methods of the physiological anatomist—the man who studied structure only as the handmaid of function, and who saw in the responsive living, rather than in the unresponsive dead, the true meaning of the myriad structural peculiarities of the human body. Pure descriptive anatomy must cease to be the sole stock-in-trade of the anatomist if he is to take his proper share in the advancement of his subject.

A recent contribution[1] towards the solution of vexed anatomical problems comes from Mr. D. C. L. FITZWILLIAMS, who has had the daring to tackle one of the debated points of morphology most dear to the heart of the anatomist, and who has embarked on the enterprise armed with the knowledge gained by a careful analytical investigation of the recorded cases of cranio-cleido-dysostosis. This disease is a rare one, but its very peculiarity has made its literature somewhat extensive, and Mr. FITZWILLIAMS has been able to collect and tabulate 58 cases from published records, while he has added two cases of his own. His material is therefore sufficient to justify him in drawing conclusions as to the disposition of the characteristic lesions. Since the main features of the condition are seen in the failure of the proper development of the membrane, or dermal, bones, it is obvious that the examination of a long series of cases should furnish an index to the extent to which dermal ossification enters into the general make-up of the skeleton or into the composition of certain compound bones. The development of the membrane bones of the vault of the skull naturally suffers in this disease; but, as its name implies, the clavicle also shares in the dysostosis, and here the greatest anatomical interest in the condition lies. It is in connexion with the degree of maldevelopment of the clavicle that Mr. FITZWILLIAMS has done such good service in making some obscure points of morphology more clear. The question of the development of the clavicle has long been a vexed one. Is the clavicle developed in membrane, or in cartilage; and is it a bone added to the shoulder girdle, or is it a primordial bone, and one of the intrinsic elements of the primitive pectoral arch? These are the questions upon which, for long, anatomists have ranged themselves into different camps. GEGENBAUR has maintained that the clavicle is a dermal bone, which therefore cannot be regarded as a real part of the primitive girdle; but HOFFMAN and GOETTE have claimed the clavicle as primordial. The question is one on which opinion is likely to be divided when it is derived from a study of the development of the bone, for the ossification takes place so early, and is of such a hurried nature that observations on its exact sequence are necessarily difficult. The secondary question as to what part of the primitive shoulder girdle the clavicle represents, if it is in truth a primordial bone, has received as many answers as there are primitive parts to which to assign it. Upon the question of the ossification of the clavicle the study of cranio-cleido-dysostosis might be expected to throw much light; if it is a dermal bone its development will suffer, but if it is a cartilage bone its development may be expected to be found but little modified. In the series of cases collected by Mr. FITZWILLIAMS it was found that the condition most commonly met with was that the sternal end of the bone was present in some degree, but the acromial end was absent. This is a highly suggestive condition, for there are several anatomical distinctions between the two ends of the clavicle, and a partial demarcation is to be seen at times in the presence of vascular or nervous foramina. In those cases in which the outer extremity of the clavicle is undeveloped, it is generally found that a ligament continues the inner portion of the clavicle towards the scapula; but the curious fact about this ligament is that it does not replace the absent outer third of the bone and run to the acromion; but it becomes, as a rule, attached to the coracoid process. Two elements are therefore indicated in the clavicle, the older cartilaginous portion from the sternal end to the coracoid process, represented in the adult bone by the inner two-thirds of the bone and the coraco-clavicular ligaments; and a new and separate dermal ossification for the flat acromial end which stretches from the ligaments outwards to the acromion.

So much—and morphologists will allow that it is a great deal—the study of this interesting disease has yielded. For the rest Mr. FITZWILLIAMS maintains, and certainly correctly, that the basal centre of the coracoid process has the oldest

[1] See THE LANCET, Nov. 19th, 1910, p. 1486.

philogeny, and that by entering into the formation of the glenoid fossa it declares itself to be the true coracoid element of the pectoral girdle. This is the view that was maintained by the late Professor G. B. HOWES and substantiated by SABATIER. But this portion of the coracoid undoubtedly forms an anatomical continuity with the ligamentous bridge which continues the sternal end of the clavicle in cases of cranio-cleido-dysostosis, and therefore Mr. FITZWILLIAMS is probably correct in assuming that the whole continuity of this bar—the base of the coracoid, the coraco-clavicular ligaments, and the inner two-thirds of the clavicle—are the human representatives of the old coracoid element of the primitive pectoral girdle. There are obviously two elements combined in the human coracoid process, and the other element, which is represented by the free extremity, should correspond to the precoracoid element of the primitive girdle; and this element Mr. FITZWILLIAMS is inclined to continue as the costo-coracoid ligament. The pectoral girdle therefore, as a result of this very interesting investigation, would seem to have resolved itself into some order. The coracoid and precoracoid elements are satisfactorily located in the whole of their extent, and a host of trivial structures have been robbed of the unwarranted importance assigned to them by morphologists who are prepared to see resemblances and remnants in any and every trifling structure which happens to exist in the area in which some more important structure appears to be missing. Mr. FITZWILLIAMS will have the support of all anatomists in relegating the centres of ossification for the tip of the coracoid process to the class of "traction epiphyses" of PARSONS, for their development in connexion with the muscular origins should have been pointed out in the text-books of anatomy long ago. To the anatomist this paper will come as a lesson that it is not by any means only among the dead in the dissecting-room that the secrets of morphology are to be learned; we have ourselves published several papers during the last few months which have done much to make clear to morphologists the meaning of structures concerning which much has been written but little has been known.

Recent Studies in Epidemic Poliomyelitis.

WE have received a reprint of an interesting paper, published in the *Journal of the American Medical Association* of Sept. 24th, by Dr. SIMON FLEXNER of the Rockefeller Institute for Medical Research, under the title of "The Contribution of Experimental to Human Poliomyelitis." The suggestion that infantile paralysis might be a contagious disease was mooted more than a quarter of a century ago, and evidence in favour of this contention, both epidemiological and experimental, has accumulated and now resulted in complete demonstration. Dr. FLEXNER'S paper gives a most valuable and lucid summary of his own and other investigators' work upon this important question. Before 1907 epidemic poliomyelitis was rare in the United States, but since that year it has become widely distributed. It appears that before 1907 the disease had been increasing in frequency in Northern Europe, more especially in Scandinavia, where attention was early attracted to its investigation, and where the important work of WICKMAN laid the foundation of the recent advances. WICKMAN collected some closely allied conditions together under the generic term of Heine-Medin's disease, a name which is now extensively used in Germany. Recent studies in Scandinavia have shown that the contagion may be conveyed from the sick to the healthy by intermediaries, who are themselves healthy but act as carriers, and that the incubation period is a very variable one, ranging from 2 to 20 days, the average being from 8 to 10. Dr. FLEXNER states that in 1907 a pandemic of the disease arose, and that the United States, Austria, Germany, and France have been visited by epidemics since that date. In regard to the American cases, it is suggestive that the original outbreaks of the epidemic in the summer of 1907 occurred along the Atlantic seaboard, particularly about New York and Boston, which constitute the two main channels of entry of the immigrant streams from Northern and Eastern Europe. It is also highly significant that the second large isolated outbreak occurred about Minnesota, to which considerable numbers of immigrants from Norway and Sweden proceed.

Although the infectious nature of poliomyelitis has been suspected for so long, attempts to isolate the causal agent have until recently failed entirely or yielded organisms which subsequent research has proved to be due to contamination or to secondary infections. The recent epidemic spread of the condition, more especially during 1909, led to widespread activity in research in several countries in regard to this disease, with the result that almost simultaneously Dr. FLEXNER and Dr. PAUL A. LEWIS in America and LANDSTEINER and LEVADITI in France described an extremely minute or ultra-microscopic organism as the infective agent. It is this discovery which has proved of such interest and value in regard to our knowledge of this disease. Dr. FLEXNER describes the failure of the earlier attempts made by Dr. LEWIS and himself to transfer poliomyelitis from human beings to monkeys by the inoculation of fluids removed at different stages of the disease through lumbar puncture. It was not until September, 1909, that they were enabled to try the effects of the direct injection of an emulsion of the spinal cords of two fatal cases of the disease into the brain of monkeys, a procedure which was followed by paralysis after an interval of some days of perfect health. During the summer of the same year LANDSTEINER and POPPER also succeeded in inoculating monkeys with the spinal cord of a fatal case, but they made their inoculations into the peritoneal cavity and did not succeed in transferring the disease to other monkeys, whereas Dr. FLEXNER and Dr. LEWIS by their method were successful in transmitting the virus from monkey to monkey. The characters of the virus, so far as they have yet been discovered, are as follows: it is of very minute size and passes readily through the pores of the finest and densest porcelain filters, such as the Chamberland or Berkefeld. It thus belongs to the group of filterable viruses. It is not yet certain whether the virus has been seen. On examining under the dark field microscope an aqueous suspension

obtained by filtering an emulsion in distilled water of the spinal cord of an infected animal, bright dancing points devoid of definite size and form, and not truly motile, can be seen, but it is by no means established that these particles are the micro-organisms of poliomyelitis. The filtrates from such emulsions are very potent and very small quantities are sufficient to induce paralysis when injected into the brain of monkeys. The virus also appears to be highly resistant; it withstands glycerination for weeks or months, and also shows little reduction in potency after drying over caustic potash for weeks. If kept frozen at from 2° to 4° below 0° C. it retains its virulence for weeks, but it is destroyed by heating for half an hour at temperatures from 45° to 50° C. It can also be destroyed by 1 per cent. hydrogen peroxide solution, or by menthol. It is still not certain whether the virus has been cultivated outside the animal body on culture media, although there are some results which suggest that this is possible.

Observations made on the experimental disease in monkeys have resulted in some important additions to our knowledge of the pathology and morbid histology of the disease. The incubation period elapsing between inoculation and the onset of paralysis has varied from 3 to 33 days, the average being eight or nine. In regard to the symptoms, there is a striking similarity with those occurring in the human disease, both in regard to the severe cases and the abortive or evanescent attacks which occur during epidemics of the disease. The mortality among the inoculated monkeys is, however, much greater than that of the human cases, for whereas the death-rate in epidemics in man rarely exceeds 10 per cent., of the inoculated monkeys at least 50 per cent. died. The lesions found after death show very close correspondence with those hitherto observed in fatal cases in man. The changes are more marked in the spinal cord than in the brain, and are more pronounced in the grey matter and membranes than in the white matter. The meninges show diffuse infiltration with round cells, especially about the blood-vessels, of which the adventitial coat is alone involved, although the lumina of the vessels may be lessened by compression. The meningeal cellular infiltration does not lead to exudates on the surface, and is almost exclusively composed of mononuclear cells. The anterior and posterior horns of the grey matter are affected, the anterior more markedly. There are cellular infiltration and œdema of the perivascular spaces, and there may be hæmorrhages. The nerve cells undergo degeneration and necrosis. Changes of similar character but of slighter degree may occur in the white matter, in the brain, and in the intervertebral ganglia.

The pathogenesis of the affection appears to be that the virus gains access to the leptomeninges, setting up cellular infiltrative changes, more especially in the perivascular lymph spaces of the arteries entering the cord and medulla. These vascular lesions and their distribution determine the severity and degree of the involvement of the nervous tissues, and therefore also the extent and distribution of the clinical manifestations. The preponderating character of the lesions in the anterior horns is accounted for by the severe implication of the central arteries entering by the anterior median fissure, and the greater richness of the blood-supply to the cervical and lumbar enlargements explains their liability to severe lesions. Some interesting experiments were carried out to determine the possible modes of infection. Inoculation can be effected with greater or less success by various channels—viz., intracerebral, intraperitoneal, by subcutaneous injection, by injection in large nerves, and by some mucous surfaces. Certain theoretical considerations have led Dr. FLEXNER and Dr. LEWIS to suspect the naso-pharynx of being a common portal of entry of the virus in the human disease; they therefore endeavoured to put this question to the test in the experimental infection of the monkeys. They found that the mucosa of the naso-pharynx was readily permeable by the virus, leading to infection and paralysis. They also bring forward evidence which seems to indicate strongly that the nasal mucous membrane may not only be the channel of entry of the virus, but that it may also be a channel of elimination whereby the virus becomes spread externally. Investigation of the cerebro-spinal fluid by lumbar-puncture shows that the number of cells it contains becomes progressively increased shortly after infection and before paralysis supervenes, with the result that the fluid becomes opalescent and may coagulate spontaneously. There is also an excess of protein as shown by NOGUCHI'S butyric-acid test. This cellular reaction is not purely lymphocytic since it includes the polymorphonuclear leucocytes early in the disease. These conditions do not last long, but are soon succeeded by a stage in which the fluid is clear, non-coagulable, and does not contain an excess of protein, while the lymphocytes alone are increased. Dr. FLEXNER suggests that these observations may prove to be of value in the early diagnosis of the human cases, if systematic examination be made of the cerebro-spinal fluid in epidemics of the disease.

The question of the production of immunity to the virus of poliomyelitis has also been studied by Dr. FLEXNER and Dr. LEWIS, and although their experiments have not as yet yielded a practical method applicable to man, yet they show that an artificial immunity can be developed, and they hold out hope for the future. They find that an undoubted attack of poliomyelitis, even when not accompanied by paralysis, produces a condition in which the monkey is refractory to re-inoculation. A condition of active immunity may also be induced by subcutaneous injection of the virus, either crude or modified by various reagents. It has also been shown that in the blood, both of human beings and of monkeys who have recovered from an attack of poliomyelitis, there exist neutralising principles for the virus. Experiments are in progress with the object of endeavouring to produce a serum for use in the treatment of the disease. We have said enough to show how important Dr. FLEXNER'S work is. It is impossible not to admire the remarkable energy and assiduity implied by the acquisition of such important results within the space of one year, while the direct and practical manner in which the problems have been attacked offers an admirable model for the scientific study of diseases of obscure pathology.

Annotations.

"Ne quid nimis."

THE MEDICAL FACULTY OF THE UNIVERSITY OF LONDON.

A MEETING of the Medical Faculty was summoned by the Vice-Chancellor of the University for Friday, Dec. 2nd. Only 29 members attended, and as a quorum is 30 the meeting could not be held. This is the fourth time in succession that a failure of meeting has resulted owing to the non-attendance of a sufficient number of members. The meeting convened for the 2nd inst. was for the purpose of electing or re-electing a dean. The faculty is therefore still without a chairman. This apathy on the part of those comprising the faculty is greatly to be deplored.

THE STETHOSCOPE.

IN his new volume, "Rewards and Fairies," Mr. Rudyard Kipling reintroduces the magical machinery which produced such a charming collection of ancient silhouettes in "Puck of Pook's Hill." The new series of ghosts of the past include Laennec and Nicholas Culpepper, the great herbalist. René Théophile Hyacinthe Laennec was born in 1781 in the beautiful old Breton town of Quimper, and on the north side of the noble cathedral stands his statue. Laennec was a surgeon in the Republican army in 1799 and served in the Morbihan. Mr. Kipling's sketch of the father of auscultation has charm and interest, and if he has taken liberties with facts we do not suggest that he has exceeded the romancer's licence. If we accept Forbes's careful biography of Laennec implicitly—and it was written immediately after the physician's death, being compiled from such excellent sources as the memoirs by Kergaradec and Bayle, supplemented by notes contributed by Laennec's cousin—the true story of Laennec differs from Mr. Kipling's presentment. From these biographers it seems proved that after 1799 Laennec was occupied in Paris at the clinic of La Charité, and up to 1818 was busily engaged in a constant output of important writings. In 1818 he broke down in health, probably from incipient phthisis, to which he ultimately succumbed in 1826. In 1821 he returned to Paris and resumed his post on the staff of the Necker Hospital. Mr. Kipling represents him as a prisoner in England at some date subsequent to the battle of Assaye, and describes him as experimenting with wooden stethoscopes (shaped liked trumpets) in a Sussex village. Laennec in his great treatise describes vividly his first use of an impromptu stethoscope, which consisted of a roll of paper, and the incident, he states carefully, occurred in 1816. The early history of the stethoscope is on the whole well authenticated. In the introduction to Laennec's "Diseases of the Chest" (second edition, 1826) various kinds of materials are mentioned as employed by the discoverer—paper, wood, glass, even goldbeater's skin—but they all had a cylindrical form, and there remains no doubt as to the final shape in which Laennec left the stethoscope, a cylinder of wood 1½ inches in diameter and 12 inches long, perforated by a bore three lines in diameter, and hollowed out at one end into a funnel-shaped cavity of the same depth as the external diameter of the cylinder. The late Sir George Burrows rescued from the wards of St. Bartholomew's Hospital the remains of such an instrument, which had been the property of Dr. Bond, afterwards Regius professor of medicine at Cambridge. Burrows and Bond were two of the first to study auscultation at St. Bartholomew's, when they were serving as clerks to Dr. Latham in 1827. Burrows's instrument had one part missing when it found its way into the Museum of St. Bartholomew's in 1887, and no instrument maker in London could be found capable of restoring it, but a complete example was accidentally discovered at Westerham in Kent by Mr. A. Maude, and this is now in the same museum. The construction of these models corresponds exactly with Laennec's own description.

THE USE OF HYDROCYANIC ACID GAS FOR KILLING RATS AND RAT FLEAS.

EXPERIMENTS have been carried out in the Bombay bacteriological laboratory by Captain W. D. H. Stevenson, I.M.S., with a view of ascertaining the value of hydrocyanic acid gas as a means of killing rats and rat fleas, more particularly in plague-infected houses in India. The results of these researches have been embodied in a preliminary report which is now published as No. 38 of the new series of Scientific Memoirs of the Officers of the Medical and Sanitary Departments of the Government of India. It appears that hydrocyanic acid gas has been of late years largely used in America, Australia, and South Africa for the destruction of insect pests on plants and fruit trees, and also for the "disinfection" of houses, jails, and railway carriages to rid them of vermin. In 1901, when plague was prevalent in Cape Colony, Professor W. J. R. Simpson suggested the use of this gas to cleanse houses infested by bugs, which were then under suspicion of conveying plague infection to man; but though experiments were begun at the time they were not persevered with. Captain Stevenson discusses the action of this gas on plants, animals, insects, food, and fabrics. Its use is not attended with any injury, even to the most delicate plant, rats and mice are readily killed by it, as also are fleas and other insects, their eggs and larvæ being quickly devitalised. Dried grain acquires no poisonous properties when exposed to its fumes, nor is the germinating power affected. Moist foods, on the other hand, such as milk, butter, and flesh, like water, absorb the poison. Unlike sulphurous acid, hydrocyanic acid gas has no deleterious action on metal or textile fabrics, but the fumes do not destroy the plague organisms or other bacteria. Its use, therefore, in connexion with plague is limited to two purposes—firstly, to destroy fleas on the clothing of dirty native travellers and, secondly, to fumigate the interiors of houses to destroy rats and their fleas. So far as the utility of the process for the freeing of clothing from fleas or other vermin is concerned, Captain Stevenson reports favourably upon it and regards it as a very cheap and efficient pulicide. Its use in this direction is, under proper precautions, attended with comparatively little danger to human life. But as regards the disinfection of rat-infested houses by this means the investigator comes to conclusions not so satisfactory. In isolated houses with clear space around them it might, subject to certain necessary restrictions, be usefully employed; but in crowded localities it cannot be safely made use of. The fumes are liable to spread to contiguous houses, and the gas may pass along rat runs from one dwelling to another. There is danger also to those engaged in carrying out the process, and skilled supervision is always essential. The fumes are so deadly that a whiff of fairly strong gas is liable to kill a human being; even a trace of hydrocyanic acid in the air that is breathed causes headache and nausea. It is recorded by an expert, as to an experiment conducted in America, that persons walking 100 feet away from the building that was being fumigated could detect the odour of the gas. The faint almond smell of the fumes and the taste at the back of the throat are only appreciated for the first few moments, the sense of smell and taste being seemingly paralysed by the diluted gas after the first few whiffs. Captain Stevenson, however, describes a delicate

test which can be applied to the air by those engaged in the process of fumigation before the room is re-entered; and if this test be applied the danger to the operators would seem to be much reduced. Further reports are likely to be issued; but so far as our present knowledge goes we fear that the possible dangers associated with the employment of hydrocyanic acid gas for the fumigation of the interior of houses are likely to prevent its use, save in exceptional circumstances. Like carbon monoxide, the risks to human life connected with its employment for destruction of rats and fleas would seem to be too great to permit of its general adoption.

SPONTANEOUS DISLOCATION OF THE HIP FOLLOWING ACUTE INFECTIOUS DISEASES.

SPONTANEOUS dislocation is a rare sequel of infectious diseases. In the *Boston Medical and Surgical Journal* of Nov. 3rd Dr. Charles Greene Cumston has reported the following case. A healthy girl, aged 9 years, had a severe attack of scarlet fever in March, 1910. She was in bed six weeks. When she began to walk in the latter part of May it was noticed that she had a decided limp and that the right leg was shorter than the left. She came under observation on the 27th. She was a well-developed girl with excellent muscles. The right leg was 4 centimetres shorter than the left and in a position of marked adduction with internal rotation. The movements of the hip-joint were much limited, rotation and flexion being almost absent. The trochanter major was 4 centimetres above Nélaton's line. There was no pain on pressure. Iliac dislocation of the femur was diagnosed. To reduce the shortening and to improve the position of the limb extension was carried out for five weeks with little or no improvement. Reduction was attempted under narcosis on July 3rd. After much manipulation the head of the bone was got into the acetabulum. A plaster cast was applied and the limb was placed in abduction with extension until August 17th, when the cast was removed. The joint was in good condition, but there was muscular atrophy. Electricity and massage were applied, and on Sept. 2nd the functions of the limb were perfectly restored. The hip is much more often the seat of spontaneous dislocation than any other joint. Of 80 cases collected by Degez, the hip-joint was involved in 74, the knee-joint in 2, and the ankle-joint in 1. Dr. Cumston suggests that this greater frequency of dislocation of the hip may be due to the youth of the patients, because the hip-joint has a great tendency to the development of pathological processes in early life. Of 90 cases, the patient was over the age of 20 years in only 11. The dislocation was iliac in 80, obturator in 6, and perineal in 1. By far the most important causes of spontaneous dislocation are typhoid fever and articular rheumatism. Then, in order of frequency, follow scarlet fever, influenza, small-pox, gonorrhœa, erysipelas, and puerperal fever. In typhoid fever the dislocation usually occurs during convalescence, but in articular rheumatism and scarlet fever during the progress of the disease. The pathogenesis of spontaneous dislocation has always been a puzzle. J. L. Petit, who in 1722 first described the condition in his famous work on dislocations, attributed it to effusion of fluid into the joint, which distended the capsule and caused softening and laxity of the ligaments, and finally pushed out the head of the bone. In a number of cases hydrarthrosis has been found on operation. But whether effusion alone is sufficient to produce dislocation is not certain. Verneuil and Reclus endeavoured to explain spontaneous dislocation by abnormal muscular contraction with paralysis and atrophy of antagonists. Kummer has pointed out that slight trauma probably plays a part. This is borne out by the fact that in several cases the dislocation occurred whilst the patient was being transported from one bed to another. The morbid anatomy has recently been studied. The capsule is only softened and distended, in contrast to what occurs in traumatic dislocation, where it is always ruptured. The nature of the contents of these joints has been the subject of much discussion. Hueter believes that all spontaneous dislocations of the hip are due to purulent infection, but serous or sero-fibrinous fluid has been found. The surfaces of the joint are only slightly changed, and in many cases have proved to be normal. On the other hand, marked changes have been observed. Cartilaginous growths have been found on the head of the femur during arthrotomy, and the cartilage covering the acetabulum has been sometimes eroded. If the dislocation is not soon reduced the joint cavity quickly becomes filled with connective tissue. Muscular atrophy and contraction have been found in a number of operations. Spontaneous dislocation is usually first discovered when the patient begins to walk. If discovered early, it can frequently be reduced. Otherwise reduction is difficult or impossible in consequence of the anatomical changes. The treatment should, in the first place, be preventive. If in fevers there has been a faulty position of the limb for some time, dislocation should be looked for when the patient is about to leave his bed. If permanent flexion or adduction occurs placing the limb in a correct position may prevent dislocation. If dislocation has occurred it should be reduced. If this is impossible the limb should be placed in the best position. If reduction cannot be performed by manipulation an open operation may be necessary.

THE MEAT-SUPPLY AT SMITHFIELD MARKET.

Dr. William Collingridge, in his tenth annual report to the Corporation of the City of London, which we have already reviewed at some length, presents some figures as regards meat-supply at the Central Meat Market, Smithfield, which make instructive reading at the approach of Christmas. It is pointed out that owing to the diminishing supplies from the United States the carcass butchers have been compelled to turn more attention to the English produce. It seems, however, that the uncertainty of the supplies from foreign countries, notably, perhaps, the Argentine Republic, will always prove a disturbing factor in the continued sale of home-grown produce, a fact which was so markedly illustrated in the Christmas of 1909. The effect of the Foreign Meat Regulations has resulted in the Dutch meat bearing the label of the Dutch examining officers, and it is reported that there is an evident desire on the part of the authorities to conform to the English requirements. The Danish meat is apparently going largely to Germany, and England can only have it when the Fatherland does not want it. With respect to the supply of cattle imported alive to Deptford, where it is killed, the report shows that the ever-increasing population of the United States holds out prospect that before many years have passed the Americans may cease to export their cattle to this country, and this fact may explain the activity of the Americans in developing their works in Argentine. Whatever may be the explanation, the fact remains that our live-cattle supplies from the United States and Canada are steadily falling and in 1909 there were but 205,000 bullocks from the States and 113,000 from Canada, while the imports of refrigerated beef from the United States are now only about one-third of what they were four years ago. But the compensating influences are already showing themselves, and the year 1909 witnessed the first arrival of chilled beef from Australia. Apparently this meat was not all of first-class quality and it showed much variety as

regards size. The length of transit was 62 days, the meat being preserved by sterilising the air of the meat chamber on the "Linley" system. There was also a considerable increase of frozen meat from New Zealand, Argentine, and Australia.

PHARYNGEAL PITUITARY BODY.

THE wide interest now taken in acromegaly has given rise to many recent investigations into the origin and nature of the pituitary body. As is well known, the glandular part of the pituitary arises as an outgrowth (Rathke's pocket) from the primitive mouth of the embryo. When the base of the skull is developed the stalk of the outgrowth is separated from the body of the gland and was supposed to completely disappear. In 1888 Killian observed that a small mass of pituitary tissue may be found in the naso-pharynx. Last year Dr. W. Haberfeld[1] showed that this small mass of pituitary tissue is constant in the human naso-pharynx, and represents part of the stalk of the pituitary outgrowth. The pharyngeal pituitary lies in the submucosa of the pharynx immediately behind the septum of the nose. The mass is of small size, about the size of a grain of rice. It is in close relationship with the tonsil of the naso-pharynx. At the last meeting (Nov. 25th) of the Anatomical Society of Great Britain and Ireland Mr. J. E. S. Frazer of King's College, Strand, showed by means of models and diagrams that the stalk of the pituitary outgrowth becomes associated during development with the posterior border of the nasal septum, down which it extends for a considerable distance. A specimen which Mr. A. R. Tweedie of Nottingham recently presented to the Museum of the Royal College of Surgeons of England also throws light on the relationship of the pituitary to the septum. The specimen shows part of the head of a child who lived for some weeks. The infundibulum of the pituitary extends into the posterior border of the septum of the nose, on which the pituitary body forms a tumour-like mass. The tumour was observed during life through a cleft in the palate, but fortunately no attempt was made to remove it.

THE TOXIC EFFECTS OF ASCARIDES.

IT has long been known that ascarides possess a repulsive irritating odour which becomes more marked after section. This odour, which has been described as pepper-like by von Linstow, produces marked toxic effects upon certain persons. These effects form the subject of an interesting note in the *Münchener Medizinische Wochenschrift* of Sept. 20th by Professor R. Goldschmidt of Munich, who himself is thus affected. He refers to the previous observations on this subject by Miram, Cobbold, Huber, Leuckart, Bastian, Raillet, von Linstow, Arthus and Chanson. Raillet himself suffered from suffusion of the eyes, sneezing, nausea, and swelling of the finger after section of some ascarides. Arthus and Chanson observed similar symptoms in three persons after dissecting these worms. They also showed that the cœlomic fluid of ascarides when injected into rabbits in doses of 2 cubic centimetres sufficed to produce death in ten minutes. Since Professor Goldschmidt found himself susceptible to the toxic effects of these worms he has made inquiries of other workers and been able to collect nearly 20 instances of a like susceptibility. He believes that some persons are permanently immune to these toxic effects and can work at the dissection of these animals with impunity. As a rule, however, most people suffer at first in only a slight degree, but the severity of the symptoms increases progressively with repeated attacks, so that several workers among Professor Goldschmidt's cases stated that they had been obliged to give up working at this subject owing to this cause. Professor Goldschmidt himself has now become so sensitive to this irritant that it is only necessary for him to go near where one of his students is working at the dissection of an ascaris to get severe symptoms, and it has now become a physical impossibility for him to work with this worm. The symptoms vary in individual cases. The most common are irritation of the eyes, leading to conjunctivitis and lacrimation. Other persons commence with sneezing, which goes on to a chronic naso-pharyngeal catarrh. Later stages may be those of catarrh of other mucous membranes, with troublesome cough and with asthma. Professor Goldschmidt suffers with severe attacks of asthma occurring every night for a week, these attacks appearing at the same time each night with great regularity, a fact also observed by Bastian. Some persons are highly susceptible, so that even the first attempt to work with these worms causes severe or even alarming symptoms. If any of the body fluid of the ascaris comes in contact with a sensitive surface, such as the conjunctiva, severe inflammation rapidly develops, and sometimes, as already mentioned in Raillet's case, the hands may swell. The ascaris megalocephala of the horse is much more irritant in its effects than the ascaris lumbricoides of man, a fact noticed long ago by Bastian, who was himself sensitive to the former but not to the latter worm. The nature of the substance leading to these symptoms is as yet uncertain. Weinland has shown that free valerianic acid is one of the end products of metabolism of these animals, and has suggested that this is the causal agent, a suggestion which Professor Goldschmidt does not accept. These observations are of considerable interest, since it is known that the emanations from some other animals may lead to attacks of asthma in susceptible persons, and Dr. Marcus, a colleague of Professor Goldschmidt, who suffers from the toxic effects of ascarides, points out the analogy of the symptoms with those of hay fever.

[1] Beiträge zur Pathologischen Anatomie, 1909, vol. xlvi., p. 133.

EARLY OPERATIONS FOR CATARACT IN FRANCE.

AT a meeting of the Société d'Ophtalmologie de Paris this autumn M. Terson made some observations on the operation for cataract as performed during the first half of the nineteenth century in France, and exhibited a painting which he had found in one of the rooms of the Musée Carnavalet, of which a reproduction is given in the October number of *Recueil d'Ophtalmologie*. This represents the results of an operation for cataract by Dupuytren at the Hôtel Dieu in presence of Charles X. in 1825. In the picture discovered by M. Terson the King with a group of officers are being conducted by M. Dupuytren through one of the wards of the Hôtel Dieu, and a patient on whom the great surgeon has operated has been unbandaged and is being told to look at His Majesty. She is holding up both hands in charmed surprise at the recovery of her vision. A Sister of Mercy and some surgeons and students are in attendance. The celebrated surgeon shows the triumph, complete and certain, of this surgical operation: little pain, no blood, and, it may be added, no vitreous humour. For it is evident that, although only 50 years after Daviel, it is not his extraction that has been executed. Dupuytren preferred depression to extraction; experience had shown him that the results of depression were more advantageous, and we find in his writings the statement, somewhat audacious, that this operation diminishes danger in proportion to the frequency with which it is repeated in the same individual. Few surgical proceedings are more interesting to follow than the vicissitudes of extraction during the first half of the nineteenth century. Undoubtedly following Daviel, a pleiade of eminent oculists, Pamard, Pellier, and so many others, the proceedings of which may be found

described and considered in the Cours d'Opérations de Pellier de Quengsy, established the supremacy of extraction. Some, nevertheless, depressed or extracted according to their view of the nature of the case. Then reaction took place, and the predecessor of Dupuytren at the Hôtel Dieu, Pelletan, considered the method by displacement was applicable to the larger number of cases. A little after Scarpa, Langenbeck, and others the fear of accidents led most surgeons to use the needle. Sanson and Gosselin appeared to consider the escape of the vitreous humour as one of the ordinary results of extraction. Demours considered extraction to be preferable when there was no contrary indication. Roux, a very skilful operator, considered depression as quite an exceptional operation. Velpeau held that if the dangers of extraction were more serious and more apparent, those of depression were more numerous and more real. Sichel himself was by no means an exclusive partisan of extraction, and maintained that the indication for the two methods depended on the nature of the cataract. Nélaton and Sédillot, with some restrictions and hesitation, recommended extraction generally. About 1865 depression was still practised by certain surgeons, as by Jüngken at Berlin, but depression, in accordance with De Graefe and his school, was almost entirely given up. It may be said, then, that whilst depression modernised by preliminary iridectomy may be found occasionally indicated, extraction has been preferentially performed by all the great ophthalmologists and by the larger number of great surgeons.

THE TREATMENT OF ULCERS OF THE LEG BY A PASTE OF GELATIN, GLYCERINE, AND ZINC OXIDE.

IN the *University of Pennsylvania Medical Bulletin* for October Dr. B. A. Thomas advocates the treatment of varicose ulcers of the leg by a paste of gelatin, glycerine, and zinc oxide as superior to all other methods. It may be remembered that this paste was introduced some years ago for the treatment of certain skin diseases, particularly eczema, by Dr. Unna of Hamburg, and has attained a considerable reputation. It does not appear to have been used by him for the treatment of ulcers of the leg, but several American surgeons, of whom it is not certain which can claim priority, employed it. The treatment, however, has failed to arouse the interest it deserves. From an experience of several years of out-patient work Dr. Thomas is satisfied that it is much superior to any other treatment. The paste is prepared as follows. Two parts of the purest gelatin are dissolved by means of a hot water bath in five parts of water. While the mixture is hot five parts of glycerine and two parts of zinc oxide are energetically stirred in until the whole is cool. In cases complicated by xerodermia, hyperplasia, pruritus, or fœtor Dr. Thomas adds a quarter of a part of carbolic acid. At room temperature the paste assumes the condition of table gelatin and may be preserved for some time. Before application the paste is liquefied in a hot water bath and cooled. In the meantime the leg and foot are thoroughly cleansed with soap and water (preferably tincture of green soap), alcohol, mercury bichloride (1 in 2000 to 4000), or carbolic acid (1 in 40). The ulcer is disinfected with peroxide of hydrogen and a solution of mercury bichloride or carbolic acid. The surface is thoroughly dried and the paste is applied over the whole surface from the metatarso-phalangeal articulations to the tubercle of the tibia. A layer of gauze bandage 3 inches wide is then applied, being cut at intervals to avoid excessive overlapping and wrinkles. Another layer of the paste is applied and a second gauze bandage, and so on until three or four layers of bandage have been applied, finishing with the paste. As the paste is rather sticky a layer of shellac may be applied for fastidious patients. A thin layer of non-absorbent cotton answers the same purpose. In many cases the dressing may be left undisturbed for from two to eight weeks, and when removed the ulcer will be found healed. But it is safer to ask the patient to return in two days. If there is then any evidence of discharge at the site of the ulcer, manifested by saturation of the overlying dressing, the dressing must be fenestrated, the ulcer cleansed, and a dusting powder, such as salicylic and boric acid talcum, supplemented by a simple gauze dressing, is applied. The patient should return twice or thrice weekly for renewal of the gauze dressing. Should the paste dressing become loose from subsidence of the swelling of the leg, it must be removed and a fresh one applied. Dr. Thomas has never found it necessary to scarify, curette, or excise the floor or edges of the so-called indolent ulcer, nor to apply a stimulant or caustic of any kind in order to promote healing. The primary indication in the treatment of varicose ulcer is to support and improve the circulation in the part. The paste dressing does this by furnishing a veritable new skin. It is freely pliable and slightly elastic, contracting somewhat after its application. These qualities cannot be ascribed to the ordinary bandage or even to the elastic stocking. A great advantage is that dressings are necessary only at long intervals, and the period of healing is shorter.

CHOLERA IN MADEIRA.

WE learn from our correspondent in Madeira that there is reason to hope that the invasion of cholera will not prove a lengthy one. The Lisbon authorities were in the first instance not over prompt, for they sent out a bacteriologist to investigate the suspected cases, but made no report upon what he found for a week. The Governor of Madeira then requested the assistance of Dr. Michael Grabham, and the vibrio was found in some abundance. During the six weeks since the first cases came under notice 40 to 50 cases occurred, with 20 deaths, but the authorities are working well, and it is hoped that the invasion has been successfully checked, although the number of cases is now much larger. The Royal Mail Steam Packet Company's steamers will not call at Madeira, outwards or homewards, until further notice.

Mr. Eben Henry Edwards, M.B., C.M. Edin., has been granted His Majesty's Royal Licence to wear the Insignia of the Third Class of the First Division of the Imperial Chinese Order of the Double Dragon, conferred upon him by His Majesty the Emperor of China.

Mr. Sylvanus Glanville Morris, M.D. Edin., has been appointed a Knight of Grace of the Order of the Hospital of St. John of Jerusalem in England.

Dr. Thomas Buzzard has been elected a Foreign Corresponding Member of the Société de Neurologie, Paris.

DEATH OF DR. AUGUSTUS HENRY BAMPTON.—Dr. A. H. Bampton died at his residence, Brookfield, Ilkley-in-Wharfedale, Yorkshire, on Nov. 26th, in his fifty-ninth year, from pneumonia after a short illness. Dr. Bampton was born in Devonshire and was formerly a lieutenant in the Royal Navy. On leaving the service he studied medicine and graduated M.D. and M.Ch. of the Royal University, Ireland, in 1879. After holding appointments at Westminster Hospital and the South Devon and East Cornwall Hospital, Plymouth, Dr. Bampton commenced practice in Plymouth, joining the late Dr. W. Bazeley in partnership. He was formerly assistant physician to the Plymouth Public Dispensary. About 20 years ago Dr. Bampton left Plymouth and practised at Ilkley, in Yorkshire. He was medical officer of health of Ilkley, and surgeon to the Ilkley Cottage Hospital. Dr. Bampton contributed several articles to THE LANCET and other medical journals.

THE LONDON COUNTY COUNCIL AND THE ROYAL COMMISSION ON THE FEEBLE-MINDED.

THE General Purposes Committee submitted to the London County Council on Dec. 6th an exhaustive report, prepared by four or five of the committees most directly concerned, in which the recommendations of the Royal Commission on the Care and Control of the Feeble-Minded were examined in their bearing upon lunacy administration in London. The Commissioners in their report admitted that the position of London in regard to the care of the mentally defective was exceptional, not so much by reason of insufficiency of accommodation as through the lack of any machinery for re-adjusting the relations of the various authorities concerned —viz., the guardians, the Metropolitan Asylums Board, and the Education and Asylums Committees of the County Council. This division of work involved also a division of authority and a lack of coördination fatal to any successful treatment of the problem, and, holding this view, the Royal Commission specially considered methods of setting up administrative machinery in London.

The report of the Royal Commission was dealt with in THE LANCET at the time of its publication in 1908.[1]

The New Authorities to be Set Up.

On the recommendation of the Commission that there should be "one central authority for the general protection and supervision of mentally defective persons" the Local Government Committee raised the question whether this work could not be undertaken conveniently by the Local Government Board, suggesting that the overlapping of jurisdiction was as great an evil in Government Departments as in the case of local authorities. In regard to the work of the local authority under the Commission's proposal, the Local Government Committee urged the desirability of so constituting the Statutory Committee for the Feeble-minded that when the recommendations of the Poor-law Commission came to be dealt with the nucleus of the organisation for public assistance would be already in existence. Although the powers proposed to be given to the Statutory Committee were not exclusively of the nature of public assistance, in practical administration there would be very considerable similarity, and the two matters were so interwoven that if the two services were placed under separate authorities there would be a danger of overlapping and friction. The difficulty would also occur of finding sufficient members to man two important statutory committees of this kind.

Importance of a Comprehensive Scheme.

The Asylums Committee was of opinion that the recommendation of the Commission with regard to "friendly visitors" to advise as to training, education, or marriage was a serious and common-sense attempt to deal with a very complicated phase of the lunacy question—the inter-marriage and consequent propagation of imbeciles. The committee had been endeavouring for years to secure the establishment of receiving houses and receiving wards, and was therefore much gratified to find the Royal Commission recommending their compulsory establishment. Generally speaking, the Commission gave the proposed committee a very wide discretion, and only experience could show what would be the best course to pursue under certain conditions. The Asylums Committee laid stress on the importance of the question of insanity and feeble-mindedness being comprehensively dealt with. At present the ascertainable body of insanity was obscured by a wide fringe of feeble-mindedness which could not be dealt with adequately under existing powers, and from this fringe lunatics, officially recognised as such, were being recruited constantly. Unless drastic measures were adopted the only prospect of elimination of future generations of the insane and degenerate stock seemed to lie in such measures as suggested by the Royal Commission.

Mentally Defective Children and Inebriates.

On that portion of the recommendation of the Commission dealing with mentally defective school children the Education Committee agreed that a register of mentally defective children should be kept, and thought that the duty of compiling it should fall on the Education Committee, and that some effective means should be devised to prevent duplication or conflict of medical certificates. The committee also agreed that observation centres or homes for scientific and medical differentiation should be established, but was of opinion that the provision of intermediate schools for dull or backward children needed careful consideration, and perhaps an experimental school should be established in the first instance. As to what authority should be responsible for the education and training of mentally defective children considerable difference of opinion existed, but the Education Committee had come to a conclusion in agreement with the Royal Commission that the proposed central authority should be responsible for both children and adults.

The Asylums Committee and the Public Control Committee were in general accord with the recommendations of the Commission with regard to criminal mental defectives and inebriates. The Public Control Committee, however, pointed out that if the recommendation that such inebriates as were mentally defective should be dealt with under the proposals of the Commission a heavy additional financial burden would fall upon local authorities.

The Cost of the Proposals: Respective Shares of the Government and Local Authorities.

The probable effect of the Commission's proposals on local taxation was next considered. The Local Government Committee considered both the methods suggested by the Royal Commission for readjusting local expenditure and exchequer contributions to be open to objection. The block grant system would be unfair to London and other urban areas where the higher rateable values necessitated a higher rate of expenditure. The second method—of adding a new grant for new cases to the grants now paid—would complicate still further the system of imperial subventions. The proposal to make grants for a limited time towards the provision of accommodation would give most assistance to authorities which had been most backward in making proper provision for the mentally defective. It would be more equitable to base the grant on the total accommodation provided.

The Finance Committee pointed out that the extension of control to all mentally defective persons would involve an increase in expenditure, and the financial operations of the proposed statutory committee would be very large. The cost to the Council would come under two heads: (1) Expenditure on services now carried out by other authorities and the Council's own present expenditure; and (2) new expenditure involved by carrying out the proposals of the Commission. There would not be an addition, presumably, to the burdens of the London ratepayer under the first head. Shortly stated, the enlarged scope of operations of the new committee would involve increased expenditure in carrying out the following new duties: (*a*) Detention and control of defective children after school-age; (*b*) compilation of register of mentally defectives; (*c*) appointment of medical officers and certifying medical practitioners; (*d*) detention of mentally defective persons convicted of offences, and control over defective persons who would otherwise frequent the casual wards of workhouses and other shelters; and (*e*) compulsory provision of accommodation for mentally defective inebriates.

The Cost to London.

It was impossible to estimate the cost to London of carrying out the whole of these recommendations, but some idea might be gathered from the figures given by the Commissioners for the whole of England and Wales. They estimated the additional cost at £899,532, or an increase over the present cost of £541,492. The Finance Committee pointed out that savings in administrative expenses owing to coördination and economy, the result of better classification, would occur. Under the present system there was considerable pressure on the relatively costly asylum accommodation by reason of the "feeble and decrepit" old people whom the guardians passed on. The exclusion from lunatic asylums of persons who did not need such expensive treatment should result in considerable economy. It was in order to avoid clogging special institutions with unimprovable cases that the Commission proposed the appointment of one authority in each county or county borough to ensure that persons should be passed on to institutions best fitted for them. It might be assumed that some economy to the public purse would

[1] THE LANCET, Sept. 12th (p. 819), 19th (p. 890), and 26th (p. 959), and Oct. 3rd (p. 1018), 1908.

ensue from the avoidance of the duplication and even triplication of certificates prior to admission which occurred so frequently under the present system. The Finance Committee rejoiced to see in the Royal Commissioners' recommendations unity of financial administration foreshadowed, thus securing to the ratepayers the fullest possible economy. The Finance Committee endorsed the objections of the Local Government Committee with regard to the readjustment of cost between local authorities and the Government, and remarked in conclusion that the care and control of the mentally defective was universally recognised as a national, rather than a local, question; and it was satisfactory to note that the Commission realised and pointed out the need for "substantial financial assistance" from the Exchequer. When the time came it would be imperative for the Council to take steps to ensure that adequate assistance was granted from Imperial funds to meet the cost of carrying out effectively any proposals made as a result of the Commissioners' report.

The Recommendations of the Committees.

The recommendations attached to the joint report of the committees were: (*a*) That the Council welcomes proposals for the coördination of the administration of controlling persons of all ages coming under the term "mentally defective" as defined by the Royal Commission. (*b*) That no opinion be expressed with regard to the constitution of the proposed board of control, but that in the opinion of the Council the control should be vested in a single Government department. (*c*) That if the Council is required to undertake the work it should be discharged through a statutory committee of the Council with the power of coöption, financial control and the determination of new principles to rest with the Council. (*d*) That adequate provision should be made for close coöperation with any authority that may be set up hereafter for dealing with the administration of public assistance. (*e*) That in the opinion of the Council the care and control of mentally defective persons is a national service administered locally, and while not agreeing with the methods proposed by the Royal Commission for the allocation of Imperial grants the Council is of opinion that provision for an appropriate measure of Exchequer assistance should accompany any reorganisation or extension of the administrative machinery for dealing with such persons. (*f*) That a copy of the foregoing resolutions be forwarded to the Government.

In view of the absence of several leading members of the Council in connexion with Parliamentary elections, the consideration of the report was postponed.

Proposals for Increased Accommodation for Defectives.

Reporting concurrently on the provision of accommodation for mentally defective children in London, the Education Committee mentioned that in 1908 the Council decided that no additional schools for the mentally defective should be provided pending the issue of the report of the Royal Commission. In the event of the proposals of the Commission becoming law the special schools for the mentally defective provided by the Council would continue to be carried on, in all probability by the Council, although the expenditure connected with them would not be charged to the education account. Until it was known what action would be taken in regard to the report of the Commission, the committee considered the work of the Council should continue substantially on the present lines—i.e., that accommodation should be provided to meet immediate needs, but that the question of future requirements should remain in abeyance. Following proposals to provide 220 school places for mentally defective children already agreed to, the committee submitted further schemes to provide 610 more places.

The Finance Committee, reporting on these proposals, stated that it had thought of postponing their consideration until the Council's policy in regard to the report of the Royal Commission had been formulated. However, the recommendations of the various committees (see above) were confined to a general approval of the principles of the Commissioners' report, and did not afford much help in the direction of settling the important question of policy to be adopted in meeting the present need for accommodation for mentally defective children in London. It seemed likely that for some considerable time to come day school accommodation would be required for these children, whether or not the education authority continued to be entrusted with their care, and therefore the Finance Committee had given its approval to the Education Committee's proposals. Remembering that special cost twice as much as ordinary school accommodation to provide, the Finance Committee would have advocated, if it were practicable, that some temporary measures should be adopted until the trend of future legislation was ascertained, but the committee was assured that certain difficulties prevented the adoption of this course.

Possibility of Special Schools becoming Obsolete.

In the course of a short discussion on the Education Committee's proposals, Mr. Leon deprecated any further expenditure on provision for defective children until it was seen what action would be taken by the Government on the report of the Royal Commission. While he was by no means opposed to provision for defective children, he objected to the expenditure of large sums of money on their behalf while the normal children suffered through being taught in unduly large classes. He was afraid this expenditure might be an excuse for cutting down the sums allocated to the ordinary elementary schools. Moreover, having regard to the recommendations of the Royal Commission on the subject, he doubted very much if the mentally defective child in the future would be taught in schools of the kind proposed to be erected, and the Council might find it had practically thrown money away. It would be worth while waiting one or two years—he did not think it would be longer—for a national settlement of this question. He regarded it as undesirable to spend large sums in educating these children only to make it more possible for them to increase an undesirable race. Mr. Jay, the chairman of the committee, said he had a great deal of sympathy with what Mr. Leon had said. As there seemed no prospect of the Government dealing with the whole question, the Council was bound to make provision for those children actually out of school, which was all that was proposed to be done. The proposals before the Council had no reference to future requirements. He agreed that their expenditure might turn out in the end to be very unremunerative and unsatisfactory, but, unfortunately, they could not help that. The proposals for additional accommodation were then agreed to.

MEDICINE AND THE LAW.

A Medical Man's Experience of the Workmen's Compensation Act.

A PAPER recently read by Dr. R. J. Collie at the eleventh Congrès International des Maladies Professionnelles, held at Brussels,[1] contains much that is instructive and suggestive with regard to the administration and practical working of the Workmen's Compensation Act, 1906. This more or less recent statute has now been on trial long enough for its weak points to have been fairly well brought home to employer and employed. It has caused and is causing considerable expenditure to the former, who does not grudge this when it provides compensation in cases of undeserved and unavoidable incapacity occurring by accidents to his servants, but who at the same time finds himself laid open to exploitation in many instances in a manner inconsistent with the acknowledged principles of law and justice. Dr. Collie informs us that in the 12 months preceding the reading of the paper referred to, he conducted 1464 examinations of injuries, of which 844 were examinations of medico-legal cases, mostly in connexion with threatened actions at common law, but many of them under the Workmen's Compensation Act. He speaks, therefore, as an expert looker-on or as one of those who proverbially see most of the game, and from his point of vantage he has made the most of his opportunities for observation. Fully alive to the benefits conferred by the Act upon the genuine case of accidental injury, he has also been strongly impressed by the physical and moral injury arising to the workman, who is induced to become an idler, a pseudo-neurasthenic,

[1] The Medico-legal Aspect of the British Workmen's Compensation Act, 1906. a paper read at Brussels, Sept. 10th–14th, 1910, by R. J. Collie, M.D., J.P., Medical Examiner for the London County Council, Chief Medical Officer for the London Water Board, Examiner (Accidents and Claims), Sun Insurance and other Accident Offices. London: Baillière, Tindall, and Cox, 1911, pp. 40.

and a malingerer by the temptation to formulate a fraudulent or inflated claim for compensation. We need not dwell upon the methods of the malingerer, with the exposure of which Dr. Collie's name is sufficiently associated for objection to have been made recently in London to his examining a workman, alleged to have been injured, except in the presence of his solicitor—an objection not upheld by the court. Dr. Collie points out that the evils arising out of claims of the kind suggested might be minimised by easy and uncomplicated alterations of procedure for which he makes practical suggestion. In particular he points to the rare and ineffective use made of the medical referees which the present Act and its predecessor have called into being. In cases under the Act of 1906, when a claim is made in respect of industrial diseases ranking as accidents, a certifying surgeon appointed under the Factory and Workshop Act, 1901, has to give a certificate of incapacity, or to refuse it. If the employer or the workman is aggrieved by the act of the certifying surgeon in this respect the matter is to be referred to a medical referee, whose decision is final. Thus the last word upon a disputed point of a purely medical nature is spoken by a specially qualified medical man. In other cases the most keenly fought contests upon questions equally of a scientific character may take place with highly technical expert evidence on both sides before a county court judge alone; an impartial judge no doubt, but a layman wholly unqualified to decide "when doctors disagree." It is true that a case may be referred to a medical referee on the application of both parties; but Dr. Collie points out that, as might be expected, this very rarely takes place, and he suggests that either party, instead of both by agreement, should be able to claim to have the medical decision of the case placed in the hands of a medical referee. Again, the medical referee may be summoned by the judge to sit with him as an assessor. The inefficacy of this provision in practice is shown by the fact that in one year (1908) medical referees were summoned to sit with judges in 145 cases only, so that as there were about 340 medical referees in existence not one-half of their number acted as assessors in the course of a whole year. The suggestion made by Dr. Collie on this point is that a medical referee should sit as assessor on the application of either party. Thirdly, the judge may submit to a medical referee for report any matter which seems material. In this case it appears to be open to the judge or arbitrator to act upon the referee's report and to treat it as conclusive, but he is not bound to do so, and here again the intervention of the referee is in the discretion of the judge, and is not to be brought about by one of the parties who may desire to have a medical question submitted to an independent medical expert. Dr. Collie would have medical referees appointed in large centres as whole-time, salaried officials, like county court judges, occupying as these do entirely independent positions, and he is of the opinion that no better course could be followed than that recommended by the Departmental Committee on the Workmen's Compensation Act, 1906—namely, that in six selected districts independent State-paid medical referees should be instituted as an experiment, and that the plan should be gradually extended if it were to be found to work satisfactorily. A practical suggestion made on behalf of the working man should be noted by those inclined to think that, occupied with the unmasking of the malingerer, Dr. Collie is unable to appreciate the point of view of those for whose benefit the Act was passed. He points out that the provision against "contracting out" in any form inflicts considerable hardship upon those workmen who suffer from some physical incapacity which suggests a possible predisposition to accidental injury, or which might increase the consequences of injury if an accident of a particular kind were to happen. As the law stands, a workman who so suffers is almost sure to be refused employment in many instances where he would obtain it if he were to be permitted to "contract out" of his right to compensation for injuries due to, or increased by, the conditions specified in his contract. Possibly when the legislature has leisure to consider matters of the class referred to above, in the light of experience such as that of Dr. Collie, the Workmen's Compensation Act, 1906, may be amended so that it will work more justly to both classes—employers and employed, and in such a manner as to minimise its corrupting influence upon the latter. At present, to take the figures of the year 1908, out of 328,957 claims in respect of industrial accidents only 2503 were decided in the courts, and out of 2503 claims which came into court 82 per cent. ended in favour of the applicants for compensation. Where the odds are so long against the defending party and where the litigation is at the suit of an adversary who cannot in the event of losing pay the costs of the successful litigant, caution deters the insurance company from the contest, and claims are settled, not because they are just, but because it is cheaper to give way than to seek justice.

An Action for Libel.

At the Leeds assizes recently, before Mr. Justice Lawrence and a jury, an action was brought by Mrs. Louisa Robinson of Halifax against Dr. J. P. I. Harty and Mr. A. N. Brushfield of Halifax to recover damages for an alleged libel contained in a medical certificate to the guardians in which it was suggested that she was a malingerer. The plaintiff conducted her own case, while the defence was in the hands of Mr. J. A. Compston, instructed by Messrs. Hirst and Whitley on behalf of the London and Counties Medical Protection Society. Mr. Compston submitted that there was no case for the defendants to answer. It was a matter of privilege and was also hopelessly out of time. His lordship agreed, and the jury returned a verdict for the defendants.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In 77 of the largest English towns 7242 births and 5866 deaths were registered during the week ending Dec. 3rd. The annual rate of mortality in these towns, which had steadily increased in the five preceding weeks from 13·0 to 17·3 per 1000, further rose to 18·1 in the week under notice. During the first nine weeks of the current quarter the death-rate in these towns averaged 14·5 per 1000. In London during the same period the death-rate, calculated on the probably over-estimated population, was equal to 15·2 per 1000. The annual rates last week in the 77 towns ranged from 7·2 in Handsworth, 8·5 in Walthamstow, 11·0 in Willesden, and 11·3 in East Ham, to 22·4 in Dewsbury, 22·7 in Swansea, 24·8 in Huddersfield, and 26·2 in Great Yarmouth. The 5866 deaths from all causes in the 77 towns last week showed a further increase of 249 on the numbers returned in recent weeks, and included 416 which were referred to the principal epidemic diseases, against numbers increasing from 361 to 420 in the four preceding weeks; of these 416 deaths, 231 resulted from measles, 49 from diarrhœa, 45 from whooping-cough, 42 from diphtheria, 25 from scarlet fever, and 24 from enteric fever, but not one from small-pox. The mean annual rate of mortality from these epidemic diseases in the 77 towns last week was equal to 1·3 per 1000, and corresponded with the rate in the previous week. No death from any of these epidemic diseases was registered last week in Rhondda, Leyton, Southampton, South Shields, Halifax, or in 10 other smaller towns; the annual death-rates therefrom ranged upwards, however, to 3·9 in Rotherham, 4·2 in Grimsby, 4·3 in Brighton, and 6·5 in Tynemouth. The fatal cases of measles in the 77 towns, which had steadily increased in the four preceding weeks from 101 to 192, further rose last week to 231, and exceeded the number in any previous week of this year; they caused the highest annual rates, 2·4 in Portsmouth, 2·8 in Grimsby, 3·1 in Rotherham, 3·6 in Brighton, and 3·7 in Tynemouth. The 49 deaths attributed to diarrhœa in the 77 towns showed a further decline from recent weekly numbers. The 45 deaths from whooping-cough were fewer by 11 than those returned in the previous week, but caused an annual rate equal to 1·5 per 1000 both in Wolverhampton and in Middlesbrough. The 42 fatal cases of diphtheria also showed a distinct decline from recent weekly numbers, but included 14 in London and its suburban districts, 3 in Birmingham and King's Norton, 3 in Manchester, and 2 each in Bolton, Bury, and Sunderland. The 25 deaths from scarlet fever were within one of those returned in the previous week; 5 occurred in Liverpool and 2 both in Manchester and Leeds. The deaths referred to enteric fever, which had been 32, 21, and 25 in the three preceding weeks, were 24 last week, of which 7 were returned in London and its suburban districts, 3 in Wigan, and 2 both in Manchester and Grimsby.

The number of scarlet fever patients under treatment in the Metropolitan Asylums and the London Fever Hospital, which had been 1882, 1843, and 1769 at the end of the three preceding weeks, had further declined to 1746 on Saturday last; 170 new cases of this disease were admitted to these hospitals during last week, against 180 and 153 in the two previous weeks. The 1974 deaths from all causes in London last week included 669 which were referred to pneumonia and other diseases of the respiratory system, against numbers increasing from 246 to 558 in the four preceding weeks; they exceeded by 274 the corrected average number in the corresponding week of the five years 1905–09. The causes of 52, or 0·9 per cent., of the deaths registered during last week in the 77 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified last week in London and in its eight suburban districts, in Manchester, Bristol, Bradford, Newcastle-on-Tyne, Nottingham, and in 42 other smaller towns; the 52 uncertified causes of death in the 77 towns last week included 9 in Liverpool, 6 in Birmingham, 4 in Stoke-on-Trent, 4 in Rochdale, and 3 each in Portsmouth, Leicester, and Sheffield.

HEALTH OF SCOTCH TOWNS.

In eight of the principal Scotch towns 780 births and 633 deaths were registered during the week ending Dec. 3rd. The annual rate of mortality in these towns, which had been equal to 13·3, 16·2, and 16·5 per 1000 in the three preceding weeks, further rose to 17·5 in the week under notice. During the first nine weeks of the current quarter the death-rate in these eight towns averaged 14·5 per 1000, and corresponded with the mean rate during the same period in the 77 largest English towns. The annual death-rates in the eight Scotch towns last week ranged from 11·2 and 16·9 in Aberdeen and Edinburgh, to 21·0 in Perth and 22·2 in Leith. The 633 deaths from all causes in the eight towns last week showed a further increase of 33 upon the numbers in the three preceding weeks, and included 47 which were referred to the principal epidemic diseases, against 61 and 55 in the two previous weeks; of these 47 deaths, 16 resulted from diarrhœa, 11 from diphtheria, 10 from whooping-cough, 5 from scarlet fever, 3 from "fever," and 2 from measles, but not one from small-pox. The mean annual rate of mortality from these epidemic diseases in the eight towns last week was equal to 1·3 per 1000, and corresponded with the rate from the same diseases in the 77 English towns. The deaths attributed to diarrhœa in the Scotch towns, which had been 17, 24, and 15 in the three preceding weeks, were 16 last week, and included 5 in Glasgow, 4 in Dundee, and 3 in Edinburgh. The 11 fatal cases of diphtheria showed a decline of 3 from the number in the previous week; 5 occurred in Glasgow, and 2 both in Dundee and Perth. The deaths from whooping-cough, which had been 13 and 12 in the two previous weeks, further declined last week to 10, of which 7 were returned in Glasgow and 3 in Leith. The 5 fatal cases of scarlet fever were fewer by 6 than the number in the previous week, and included 2 in Glasgow. The 3 deaths referred to "fever" included 2 certified as enteric fever, and 1 as cerebro-spinal meningitis. The deaths referred to diseases of the respiratory system in the eight towns, which had been 65, 121, and 138 in the three preceding weeks, further rose to 157 last week, but were 108 below the number in the corresponding week of last year. The causes of 15, or 2·4 per cent., of the deaths in the eight towns last week were not certified or not stated; in the 77 English towns the proportion of uncertified causes of death last week did not exceed 0·9 per cent.

HEALTH OF IRISH TOWNS.

In 22 town districts of Ireland, having an estimated population of 1,151,790 persons, 554 births and 400 deaths were registered during the week ending Dec. 3rd. The mean annual rate of mortality in these towns, which had steadily increased in the four preceding weeks from 15·1, to 19·1 per 1000, declined again to 18·1 in the week under notice. During the first nine weeks of the current quarter the annual death-rate in these Irish towns averaged 17·0 per 1000; the mean rate during the same period did not exceed 14 5 in the 77 largest English towns or in the eight Scotch towns. The annual death-rate during last week was equal to 21·9 in Dublin, 14·5 in Belfast, 13·7 in Cork, 15·6 in Londonderry, 23·2 in Limerick, and 19·5 in Waterford; the mean annual death-rate last week in the 16 smallest of these Irish towns was equal to 19·2 per 1000. The 400 deaths from all causes in the 22 town districts last week showed a decline of 23 from the number in the previous week, and and included 36 which were referred to the principal epidemic diseases, against 18 and 29 in the two previous weeks; these 36 deaths were equal to an annual rate of 1·6 per 1000; in the 77 English towns and in the eight Scotch towns the mean rate from the same diseases last week did not exceed 1·3 per 1000. The 36 deaths from these epidemic diseases in the Irish towns last week included 14 from measles, 9 from diarrhœa, 5 from diphtheria, 5 from whooping-cough, 3 from scarlet fever, and not one either from enteric fever or small-pox. The 14 fatal cases of measles showed a further increase of 6 upon the numbers in recent weeks, and included 8 in Lurgan, 4 in Armagh, and 2 in Belfast. The 9 deaths attributed to diarrhœa also showed an increase, 6 being returned in Dublin. All the 5 fatal cases of whooping-cough, 3 of the 5 deaths from diphtheria, and the 3 deaths from scarlet fever also occurred in Dublin. The deaths in the 22 towns last week included 108 which were referred to pneumonia and other diseases of the respiratory system, against 80 and 100 in the two preceding weeks. The causes of 22, or 5·5 per cent., of the deaths registered last week in the Irish towns were not certified; in the 77 English towns the proportion of uncertified deaths last week did not exceed 0·9 per cent., and in the eight Scotch towns it was equal to 2·4 per cent.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Fleet-Surgeons: W. G. K. Barnes to the *President;* E. B. Pickthorn to the *Prince of Wales*, on recommissioning; G. H. Foott to the *Albemarle*, on recommissioning; and A. H. H. Vizard to the *Queen*, on recommissioning. Staff-Surgeons: K. H. Jones to the *Highflyer*, on commissioning; H. P. Turnbull to the *Hannibal*, on recommissioning; R. W. Stanistreet to the *Euryalus*. Surgeons: H. B. German to be lent to the *Euryalus*, temporarily; A. G. V. French to the *Prince of Wales*, on recommissioning; S. Bradbury to the *Queen*, on recommissioning; L. C. E. Murphy to the *Vivid*, additional, for disposal on the *Commonwealth* reducing; and J. H. McDowall to the *Pembroke*, additional, for disposal.

ROYAL ARMY MEDICAL CORPS.

The undermentioned officers from the Seconded List, are restored to the establishment (dated Nov. 18th, 1910):—Captain William M. B. Sparkes, and Lieutenant Harold T. Treves.

The following officers have been detailed to take part in a medical staff ride in the vicinity of Salisbury: Surgeon-General H. R. Whitehead, C.B., principal medical officer of the Southern Command; Lieutenant-Colonel W. T. Swan, Major E. A. Burnside, Major N. Tyacke, Major A. E. Milner, Major C. B. Lawson, Major W. E. Hudleston, Major W. A. Ward, and Major P. H. Collingwood. Surgeon-General J. G. MacNeece, principal medical officer of the Eighth (Lucknow) Division, has joined at Lucknow, from Naini Tal. Colonel M. W. Kerin, officiating principal medical officer of the Seventh (Meerut) Division, has taken up duty at Mussooree. Lieutenant-Colonel E. J. R. Risk, administrative medical officer, Belfast District, has been selected to succeed Colonel D. Wardrop, C.V.O., as Commandant and Director of Studies at the Royal Army Medical College, whose tenure of the appointment will expire on Feb. 4th next. Lieutenant-Colonel G. Cree, from Madras, has been appointed to the Eastern Command for duty. Lieutenant-Colonel H. M. Thompson, D.S.O., commanding the Station Hospital at Lucknow, has arrived home on leave. Lieutenant-Colonel F. W. Caton Jones, from Tidworth Park, has been selected to command the Station Hospital at Quetta. Lieutenant-Colonel W. L. Reade, from Dublin, has joined at Mauritius. Lieutenant-Colonel C. T. Blackwell has been appointed to command the

Station Hospital at Madras. Lieutenant-Colonel T. B. Winter has arrived home, tour-expired from India. Major J. W. Jennings, D.S.O., has been transferred from Chester to Liverpool and posted as Recruiting Medical Officer. Major A. E. Thorp, from Tidworth Park, has embarked for a tour of foreign service in South Africa. Major G. B. Riddick, from Maymyo, has taken up duty at Rangoon. Major G. H. Goddard, from Alderney, has been appointed to the Medical Charge of the Military Families Hospital at Shorncliffe. Major H. G. Stallard, Captain J. G. Foster, and Captain H. E. Howley have embarked in H.M.T. *Dongola* for a tour of service in India. Captain M. Keane has been appointed Staff Surgeon in charge of Meerut Divisional Headquarters, vice the late Major R. Selby. Captain H. C. R. Hime, in charge of the Brigade Laboratory at Madras, has been appointed a Specialist in the Prevention of Disease. The following officers (Captains) have joined at the Royal Army Medical College for a course of instruction for promotion to the rank of major:—F. J. Brackenridge, R. B. Black, P. Davidson, D.S.O., R. L. V. Foster, S. M. W. Meadows, D. S. Skelton, J. G. Bell, A. E. B. Wood, J. C. G. Carmichael, R. H. Bridges, J. A. W. Webster, F. C. Lambert, J. B. Meldon, R. C. Wilmot, H. B. Kelly, E. M. Pennefather, B. H. V. Dunbar, D. G. Carmichael, J. M. M. Crawford, and C. Bramhall. Captain C. H. Turner has arrived home from India, tour-expired. Captain E. W. Powell, from Belgaum, has joined at Aden and has been appointed to the charge of the Brigade Laboratory. Captain W. R. P. Goodwin, from Woolwich, has been placed under orders for a tour of service in India. Captain R. B. Black, on the termination of his appointment with the Egyptian army, has had the order of the Osmanieh (Fourth Class) conferred on him by the Khedive. Captain W. McConaghy has been transferred from Wedgnock Camp to Tidworth Park. Captain J. du P. Langrishe, from Mhow, has joined at Poona. Lieutenant H. T. Treves, on return from special service under the Colonial Office in Uganda, has been posted to the London District. Lieutenant M. J. Williamson has joined at Tidworth Park from Hamilton Camp. Lieutenant A. G. Moutray has been granted nine months' leave home from India.

INDIAN MEDICAL SERVICE.

Surgeon-General C. P. Lukis, C.S.I., Director-General of the Indian Medical Service, has been appointed an Ordinary Fellow of the Calcutta University. On relief by Colonel C. F. Willis, Lieutenant-Colonel J. W. Rodgers has been appointed to officiate as Principal Medical Officer of the Sirhind and Jullundur Brigades during the absence on eight months' leave of Colonel A. M. Crofts, C.I.E. Lieutenant-Colonel W. H. Quirke, Bombay, has been granted three months' extension of his leave on medical certificate. Lieutenant-Colonel R. J. Marks, on return from leave, has been appointed Civil Surgeon at Gorakhpur. Lieutenant-Colonel H. F. Cleveland, secretary to the Principal Medical Officer His Majesty's Forces in India, has arrived home on leave. Major J. W. Grant has been appointed by the Foreign Department of the Government of India to be Residency Surgeon to the Western States of Rajputana, in succession to Lieutenant-Colonel R. C. Macwatt, who has proceeded on combined leave. Major W. H. Kenrick, civil surgeon at Nimar, has been placed on special duty under the orders of the Sanitary Commissioner of the Central Provinces. On return from furlough Major D. W. Sutherland has taken up duty as Principal and Professor of Medicine and Diseases of Children at the Medical College, Lahore, relieving Major H. G. Melville. Major W. Selby has been transferred from Gorakhpur to Lucknow as Civil Surgeon. Major C. Thomson has received an extension of his leave to Jan. 29th next. The services of Captain A. C. MacGilchrist, officiating Professor of Materia Medica at the Medical College, Lahore, have been replaced at the disposal of the Government of India. Captain S. B. Mehta has been appointed Assistant District Plague Medical Officer at Lyallpur. Captain H. Watts, Bombay, and Captain F. N. White have arrived home on leave from India. On return from duty at Pachmarhi Captain J. M. C. MacMillan has been appointed Civil Surgeon at Hoshangabad, Central Provinces. Captain S. C. Chuckerbutty has been posted for plague duty at Bassein. Captain H. Ross has joined the Civil Medical Department of the United Provinces and has been appointed Civil Surgeon of Etawah. Captain A. H. Proctor has received an extension of his leave to Feb. 16th next. Captain J. F. Boyd, in charge of the Brigade Laboratory at Bannu, has been appointed a Specialist in the Prevention of Disease. Captain M. F. White has embarked for Bombay on the expiration of his leave home.

The King has approved of the retirement of the undermentioned officers of the Indian Medical Service: Colonel Patrick Alexander Weir (dated Oct. 26th, 1910), and Lieutenant-Colonel Robert Evans Stuart Davis (dated Oct. 29th, 1910).

TERRITORIAL FORCE RESERVE.

Royal Army Medical Corps.

2nd Highland Field Ambulance, Royal Army Medical Corps: Lieutenant Lewis D. Cruickshank to be Captain (dated Nov. 7th, 1910).

CHANNEL ISLANDS MILITIA.

The Royal Militia of the Island of Jersey.

Medical Corps: Surgeon-Lieutenant Henry J. Shone to be Surgeon-Captain (dated Nov. 25th, 1910).

ROYAL ARMY MEDICAL CORPS JOURNAL.

In the December issue of this journal, which closes the fifteenth half-yearly volume, Major J. C. B. Statham, R.A.M.C., describes an outbreak of fever due to bacteria having unusual cultural characters "in that, though possessing many of the features of the typhoid colon group of bacteria, they ferment saccharose markedly and do not affect dulcite." Captain A. R. Tweedie, R.A.M.C. (T.), discusses the question of ambulance wagons, believing that "the fact that at least three patterns of ambulance wagons are now being used in the service affords sufficient reason to assume that no ideal type has yet been attained." His contention is that all further efforts in ambulance wagon construction should be developed on the lines of "Mark I. (Light)." Major E. C. Freeman, R.A.M.C. (R.P.), deals with the question of clearing hospitals and the Territorial Force. With regard to the Red Cross organisation, he is of opinion that it should be carried out by the medical service of the Territorial Force, and for this purpose all the Voluntary Aid Detachments should be put under the inspection of the administrative medical officer of the Territorial Force division in which they are situated, or of someone delegated by him for the purpose. This issue of the journal also contains a further instalment of the Medical History of the South African War, by Lieutenant-Colonel R. J. S. Simpson, C.M.G., R.A.M.C.

OSBORNE: REPORT OF THE HOUSE GOVERNOR AND MEDICAL SUPERINTENDENT.

The report of the house governor and medical superintendent of Osborne, Surgeon-Lieutenant-Colonel C. R. Kilkelly, for the year ended March 31st, 1910, has just been presented to Parliament. It states that there has been no variation in the accommodation provided—viz., for 43 officers and five ladies. The admissions during the year comprised 200 officers and 69 ladies—total 269, as compared with an average of 289 in the three preceding years. The average daily number in residence was 32·50. The average duration of each case of illness was approximately six weeks. The decrease in admissions is accounted for by (1) insufficient knowledge of the benefits of Osborne amongst sick officers; (2) the very large reduction in the invaliding home of officers similar to the reduction effected in the invaliding of soldiers which has taken place during the last two or three years; and (3) the establishment of nursing homes and institutions for sick officers in the hills in India where many cases pass their period of convalescence instead of coming home under the new regulations. As in previous years, by far the largest number of officers admitted belong to the home army, and nearly 33·5 per cent. of the total number of admissions were for diseases contracted on service in India. The admissions from the Royal Navy compared with those from the army furnish a ratio which agrees with the relative strengths of the navy and army in officers—viz., 1 to 7. The largest number of admissions were for (*a*) infective diseases (51), principally dysentery; (*b*) diseases of the nervous system (22), chiefly neurasthenia; and (*c*) diseases of the digestive system (65), principally inflammation and ulceration of the stomach and intestines and liver abscesses. Enteric fever, influenza, malaria, and Malta fever accounted for 24 admissions. The

two cases of Malta fever were contracted in Somaliland. All the cases of dysentery have done specially well under treatment at Osborne. The five admissions for tuberculosis were limited in extent and did not implicate the lungs. A case of malignant new growth was transferred for further treatment to the Queen Alexandra Hospital, Millbank, where the patient died. The cases of neurasthenia nearly all required more or less complete courses of Weir Mitchell treatment. The general results in these cases have been excellent considering their nature and the usually prolonged duration of the previous illness prior to treatment. There were nine admissions for various diseases of the heart and four underwent a course of treatment by Nauheim baths and Schott's exercises. The diseases of the digestive system formed the largest group of cases, and many of them had undergone operations. They included cases of appendicitis, colitis, gastro-duodenal ulcers, sprue, and liver abscesses. A case of multiple stricture of the colon was suspected to be the result of glass poisoning in India. The cases of liver abscess were the result of dysentery contracted in India. One case of liver abscess was passed fit for service by the Medical Board last February after an illness lasting since September, 1907. Amongst the general injuries a case of shock was the result of a fall of 50 feet from a kite whilst experimenting at Aldershot. There were 74 post-operation cases. There was no death. His Majesty the late King and his Majesty King George, and other members of the Royal Family visited Osborne on several occasions, and expressed their approbation of the work done. Members of the consulting staff and house committee have visited Osborne about twice every month for the purpose of consultation and inspecting the medical, nursing, domestic, and general arrangements. Sick officers in residence have constantly availed themselves of the advice tendered them as regards their health by the consultants, who have in addition frequently given them further advice and treatment gratuitously in their consulting rooms in London. The officers of the Queen Alexandra Military Hospital and the Royal Army Medical College have given much help in the treatment of cases and investigation of disease.

Correspondence.

"Audi alteram partem."

THE GENERAL MEDICAL COUNCIL AND THE PROPOSED ANÆSTHETICS ACT.

To the Editor of THE LANCET.

SIR,—As will be seen from the account of the recent proceedings of the General Medical Council[1] another definite step has been taken towards securing legislation in regard to anæsthetics. The Council has adopted the report of its Anæsthetics Committee concerning the memorandum and draft Bill submitted by the Home Secretary to the Privy Council and referred by that body to the General Medical Council for its observations thereon, and as that report is favourable to the Bill and urges the necessity for speedy legislation, it may be hoped that during the next session this or some similar Bill will be laid before Parliament. Whilst no one realises more than I do the public-spirited interest which the General Medical Council and its Anæsthetics Committee have taken, and are still taking, in this much-needed reform, I feel that, as I was responsible for the drafting of the Bill, I should like to be allowed to draw attention, though your columns, to the second of the six observations which that Council has just forwarded to the Privy Council concerning the Bill in question. The effect of the suggested amendment to Clause I. would be to permit and perhaps to encourage registered dentists to administer, for operations other than dental, the general anæsthetic or anæsthetics which the General Medical Council might from time to time include in a schedule to the Act; and the question naturally arises whether such an arrangement would give to the public that degree of protection to which, by common consent, it is entitled. Personally I venture to suggest that it would not do so, and as this was the view which the General Medical Council originally held when this proposed addition to the ordinary functions of dentists was first mooted, I hope it may not be too late again to refer to the subject. Both Dr. Blumfeld and I have already advanced in your columns[2] reasons against registered dentists administering anæsthetics in general surgical practice; and with the hope that the General Medical Council, when the present draft Bill comes back for final consideration, may see its way to reconsider this point, I venture to summarise the chief objections which seem to me to stand in the way of the proposed amendment.

The suggestion that dentists should be permitted to administer certain anæsthetics in general surgical operations was, I believe, made on the assumption that such a scheme would be of great convenience in country districts and small provincial towns where medical men might not be available at the moment when an anæsthetic was required, whilst the proposal seemed to acquire additional force from the further assumption that medical men were, as a class, inferior to dentists, so far as the administration of nitrous oxide was concerned. But as there are no registered dentists in country districts, and as practically every provincial town possessing but one dentist possesses also at least five medical men, amongst whom there would surely be one or more with an equal, if not a greater, knowledge of nitrous oxide than that possessed by the local single-handed dentist, it is, I confess, difficult to see the necessity for such a proposal. Even if it be admitted that there are many dentists who are more familiar with the administration and effects of nitrous oxide than many medical men, I would venture to say, with due respect to all those who may hold opposite views, that if by legislative enactment or otherwise it were to become the recognised custom for medical men to call in dentists to administer nitrous oxide or other anæsthetics in general surgery we should be placing all present and future medical students in the absurd position of being obliged to obtain instruction in the use of anæsthetics which, under certain conditions contained in a paradoxical Act of Parliament, they would not be expected to administer. Surely the General Medical Council, by insisting upon such an amendment to the Bill, would be putting back the clock; surely they would be commencing to undo the good work they have already done in insisting upon the proper instruction of all medical students in all general anæsthetics. But there are even weightier considerations than these—considerations regarding the patients submitted to the anæsthesia in question. From the point of view of the public, can we honestly say that a patient who, let us suppose, is ill, and is the subject of some grave visceral disease, should be anæsthetised, even for an apparently trifling operation, by a man who has had, at all events whilst in practice, no clinical experience of disease? I feel sure the dental profession will not misunderstand me in this argument. No one realises more than I do the excellence of the educational curriculum through which dental students pass and the high character of the work which that profession is doing for the public. But I do not think, and I believe that many, if not most, dentists will agree with me, that this excursion from dental into medical practice is called for, nor do I think that it would be to the interests of dentists themselves. Moreover, there are many apparently simple surgical operations which, when begun, develop into more extensive procedures, demanding at the moment a more prolonged or deeper anæsthesia; in other words, an anæsthesia which the dentist, as the anæsthetist in attendance, would neither be prepared nor legally entitled to produce. After a somewhat extensive experience with anæsthetics, and particularly with nitrous oxide, I feel more or less compelled to record my conviction that an amendment of the Bill such as that proposed would be distinctly detrimental to the public interest, for it would reopen the door to certain risks of general anæsthesia which might otherwise be prevented. As the regulations of the General Medical Council with regard to the instruction of all medical students in anæsthetics have now been in force for some time, it is obvious that the country is gradually being furnished with medical men who are able not only to administer ether and chloroform for major operations but nitrous oxide in so-called minor surgery.

I trust, Sir, that those of your correspondents who may be interested in the question of legislation in regard to

[1] THE LANCET, Dec. 3rd, 1910, p. 1625.

[2] THE LANCET, March 26th (p. 888) and April 9th, 1910 (p. 1027).

anæsthetics will express their views on the point to which I have referred. Like the main issue—that of protecting the public against the use of anæsthetics by unqualified persons—the point I have raised is one which, after all is said and done, should be decided by what is best in the interests of the patient.

I am, Sir, yours faithfully,

Dec. 6th, 1910. FREDERIC HEWITT.

THROMBOTIC SOFTENING OF THE SPINAL CORD AS A CAUSE OF SO-CALLED "ACUTE MYELITIS."

To the Editor of THE LANCET.

SIR,—In your issue of Dec. 3rd Dr. F. E. Batten says, "Most observers will be in entire agreement" with most of the views expressed in my article in THE LANCET of Nov. 26th, and in partial confirmation he refers me to the recent article on Acute Myelitis in Clifford Allbutt's "System of Medicine," Vol. VII., p. 645, 1910.

I ought to say that my article was written just 12 months ago, and therefore some time before Vol. VII. of the admirable re-issue of the "System of Medicine" had appeared. On referring to this volume I find that while the question at issue is carefully considered the old term of acute myelitis is retained on the ground of clinical convenience (!) and long usage, as well as because "the result of an acute or sub-acute focal lesion of the spinal cord is a clinical picture which varies with the site more than with the nature of the morbid process. An accurate diagnosis of the latter is often possible only after death, and not always then if the disease is of long standing."

But these difficulties are precisely as applicable to the cerebral as to the spinal affections, so that I can only regret that in the new "System" the opportunity has not been taken to rectify the inconsistency of attributing to inflammation in the spinal cord what in the parallel affections of the brain are universally acknowledged to be results of degeneration from vascular occlusions.

Correct treatment in the early stages of the spinal affection must be dependent upon a correct diagnosis, and if the practitioner is taught to regard the common run of cases of so-called "acute myelitis" as of an inflammatory nature, is he not really being led astray?

In regard to the nature of acute poliomyelitis, this has long been a source of doubt and difficulty. The little that I had to say on this subject was mainly directed to the improbability of its being due to a strictly limited common inflammation. I am quite prepared to admit, however, that much recent evidence goes to show that it is really an infective disease of a very obscure nature.

I am, Sir, yours faithfully,

London, Dec. 3rd, 1910. H. CHARLTON BASTIAN.

To the Editor of THE LANCET.

SIR,—Dr. Bastian is so intimately associated with the evolutionary history of neurology, and his share in elucidating many of its most difficult problems during the last half of the nineteenth century is so great, that any paper from his pen is eagerly read by those who are proud to call themselves his pupils. In THE LANCET of Nov. 26th there appears an article by Dr. Bastian with the above title, an article which many, I think, will agree with me should not be allowed to pass without comment or even without respectful criticism.

The earlier part of Dr. Bastian's paper expresses his view that the thrombotic element in acute myelitis, to which he has done so much to draw attention, has not received appropriate recognition. The following two quotations illustrate Dr. Bastian's feeling on this point:—

> Yet works on medicine at the present day and for some time past would have us believe that while the common softenings of the brain are results of non-inflammatory degenerations, those of the spinal cord are due to inflammation. What explanation can be given for this seemingly unwarrantable discrepancy?
>
> My views on this subject have met with only a very partial acceptance in this country, as may be gathered from the fact that in the last edition but one of the Nomenclature of Diseases, issued by the Royal College of Physicians of London, and probably also in the latest edition, as well as in Sir Clifford Allbutt's celebrated new "System of Medicine" (Vol. VII., 1899) there is no mention of softening of the spinal cord other than such as is assumed to be due to inflammation.

It would be sad, indeed, if these quotations really indicated the state of our attitude towards the question at the present time, and I hasten to assure Dr. Bastian that his suspicions are unfounded. If Dr. Bastian had read the article on Myelitis in the current edition of Sir Clifford Allbutt's "System," instead of that which was published 11 years ago, or the article on Myelitis in Osler's "Modern Medicine," or the article in Turner and Stewart's "Text-book of Nervous Diseases," he would have come to an entirely different conclusion and we should not have felt hurt by the suggestion that his writings of 20 or 30 years ago have failed to find the loyal support which they so richly deserve at the present time.

If, on the other hand, Dr. Bastian would have us discontinue employing the term "myelitis" for describing those cases of spinal disease in which thrombosis plays an important part, he raises a difficult question which he will find discussed at some length in both the Systems of Medicine alluded to above. It is too lengthy a subject to enter upon here, but reference may, perhaps, be permitted to two facts: (1) Myelitis does not strictly mean inflammation of the spinal marrow; and (2) syphilitic arteritis, which is the cause of the immense majority of cases of spinal thrombosis, is, after all, an inflammatory process.

The latter part of Dr. Bastian's article is an attempt to put back the clock and to reinstate old fallacious and confusing theories about acute poliomyelitis, and I cannot help expressing regret that it should have appeared. Acute poliomyelitis is as different from acute myelitis, with thrombotic softening, as is small-pox from superficial gangrene, or as is typhoid fever from a gastric ulcer. I can hardly believe that Dr. Bastian would still support the "primary thrombotic theory" of acute poliomyelitis if he were acquainted with the work of the last five years on the pathology and pathogenesis of that disease. The non-specific thrombotic theory was built up on the appearances observed in cases of poliomyelitis examined at lengthy periods after the onset of the disease, and the whole structure of that theory has tumbled to pieces with the careful examination of recent cases; even the débris has been cleared away by the experimental investigations of Simon Flexner and other workers in the same field. No one will deny that thrombosis occurs in the inflammation of poliomyelitis, just as it occurs in inflammation of any tissue, but recent work on the Continent, in America, and England has proved beyond doubt that the lesion of poliomyelitis, both in its endemic and epidemic form, is a widespread inflammation involving, besides the anterior horns, other parts of the cord, as well as the meninges in many cases, and that thrombosis may occur here and there only as a secondary phenomenon. It is most important for the medical profession to realise these facts, to regard the disease as a specific one due to an infective agent which has already been inoculated into monkeys with the reproduction of the identical disease in those animals, and to do all that is possible, by careful observation of the conditions under which it occurs, to advance our scientific knowledge of the disease.

Writing three years ago I expressed my belief that before long acute poliomyelitis would be included in the category of the acute specific fevers. It has the constitutional disturbances, the age incidence, the seasonal exacerbations, the sporadic and epidemic types, the immunity from second attacks, associated with the obscurity as to its bacterial origin, which are shown by measles, scarlet fever, and varicella, and the severe inflammatory lesions, limited to particular tissues, which are met with in scarlet fever, diphtheria, and variola. This belief has only been strengthened during the last three years, and I venture to prophesy that before very long acute poliomyelitis will be included among the notifiable diseases in this country, as it has been already elsewhere. My prophecy will certainly not be fulfilled if Dr. Bastian is right in believing "that there is very much evidence against the view that inflammation is at all a common cause of so-called acute poliomyelitis," and "that vascular occlusions or acute primary degenerations of the very specialised ganglion cells will suffice to account for the great majority of cases."

I am, Sir, yours faithfully,

Wimpole-street, W. E. FARQUHAR BUZZARD.

THE MOTOR FUNCTIONS OF THE STOMACH.

To the Editor of THE LANCET.

SIR,—In one of Mr. H. M. W. Gray's papers on the "Motor Functions of the Stomach," published in THE LANCET of 1908, he ascribes the discovery of secretin to Wertheimer, without even mentioning the names of Bayliss and Starling. As this is only one example of numerous inaccuracies in the papers, it is surprising that they evoked no public criticism at the time. As, however, there is a danger of frequently repeated errors being finally accepted as facts, it is desirable that some of the mistakes in Mr. Gray's recent article in THE LANCET of Dec. 3rd should be corrected.

My first observations on the human stomach with the X rays were made in the horizontal position, and I was led—like Mr. Gray—to believe that the stomach is divided into two parts, anatomically and functionally distinct. When I began to examine the stomach in the vertical position also, I soon found that I had been mistaken, and I am now convinced that there is no such thing as a "middle sphincter." It would occupy too much space to give my reasons in detail, but I may refer Mr. Gray to my paper on the subject in the *Quarterly Journal of Medicine* for July, 1910.

It is easy to see with the X rays that peristalsis begins near the centre of the stomach, where it produces a shallow depression, which increases in depth as it moves towards the pylorus. When it reaches the pyloric vestibule the depression is so great that it almost completely divides the stomach into two parts, but the wave still moves on, and the division is absent in the intervals between the arrival of successive peristaltic waves. When death occurs during digestion the depression produced by a peristaltic wave may be fixed at the point where it happened to be at the moment of death: it is this depression which has been mistaken in anatomical preparations for a third sphincter.

The idea that there is a sharp separation between the chemical processes occurring in the two ends of the stomach is also incorrect. The food taken at the beginning of a meal reaches the pyloric end first, and that taken last is at first uppermost. Some hydrochloric acid, which is secreted mainly in the cardiac end, is carried with the first part of the meal to the pyloric end, where gastric juice and food are thoroughly mixed together by the peristalsis. It is now universally acknowledged (except by Mr. Gray) that there is no peristalsis in the cardiac end; consequently the peripheral part of the food is most acid and the central part may remain for a time alkaline and undergo salivary digestion (Grützner, Cannon). The moderately acid contents of the pyloric end, the very acid food in contact with the mucous membrane of the cardiac end, and the alkaline food in its centre are quite indefinitely separated from each other, as diffusion of the saliva and soluble constituents of the food on the one hand, and of gastric juice and products of gastric digestion on the other, must constantly and rapidly take place, and the movements of the diaphragm, abdominal muscles, and body as a whole all help to mix together the contents of the different parts of the stomach.

I should be glad to know the names of Mr. Gray's "recent radiographers and others" who "assert that the pylorus during gastric digestion descends naturally below and to the left of the umbilicus." In normal individuals I have never seen it either below or to the left of the umbilicus, and all the recognised authorities on the subject, including Barclay, Pfahler, Rieder, Holzknecht, Leven and Barret, Censé and Delaforge, are in agreement with me.

And who are the "recent radiographers" who say that "carbohydrate food begins to pass through the pylorus (displaced as described) in 15 to 20 minutes, and proteid in 30 to 45 minutes"? These are the figures given by Cannon as a result of his observations on cats, but it is now admitted by all who have examined human beings with the X rays that food, whatever its nature, begins to pass through the pylorus at once, and that a considerable quantity can be seen in the small intestine—and even sometimes in its pelvic portion—within a quarter of an hour. Yet Mr. Gray states that the times quoted are "the times when he observes food beginning to pass through the 'middle sphincter,' and he gravely suggests that "these gentlemen (i.e., 'the radiographers and others') mistake the 'middle sphincter' for the pylorus"! What Mr. Gray mistakes for a middle sphincter is beyond my power of imagination.

I quite fail to understand how the relief of hunger pain is evidence in favour of a middle sphincter. If it really prevented the access of food into the pyloric end of the stomach the eating of more food ought to be without influence on the pain. As a matter of fact, I have been able to demonstrate to the satisfaction of Mr. Moynihan[1] that food leaves the stomach with unusual rapidity in cases of duodenal ulcer, and that the delay in the onset of pain is not due to food being held back by the pylorus or by Mr. Gray's sphincter. My observations are confirmed by Barclay, who states that "the picture of a normal stomach exhibiting excessive peristalsis and passing the food on very rapidly is always suggestive of trouble in or about the duodenum."

Mr. Gray can never have seen intestinal segmentation or the interesting appearances recently described by Dr. Barclay of "blobs of food" dropping into the lower part of an atonic stomach, or he would not have rejected the entirely satisfactory explanation offered by Dr. Barclay himself, and made the extraordinary suggestion that the latter is due to segmentation, to which it does not bear even the remotest resemblance.

I am, Sir, yours faithfully,

Weymouth-street, W., Dec. 5th, 1910. ARTHUR F. HERTZ.

THE OWNERSHIP OF MEDICAL PRESCRIPTIONS.

To the Editor of THE LANCET.

SIR,—The law has been declared by an eminent official to be "a ass"; it is comforting therefore to find that it may be occasionally in accordance with common-sense. I think that the opinion on the subject of prescriptions given by Mr. H. Wippell Gadd[2] may, on the whole, though it is not quite free from ambiguity, be so designated. It is gratifying to have legal authority for the tenet that the purpose of a prescription is "limited in time as well as in person." The ambiguity lies in the statement that the prescription, though conditionally, "becomes the absolute property of the person who has paid the fee." What is the meaning of "prescription" here? Is it merely a piece of paper or is it an instrument that can be used for further purposes? It seems to me that there is some analogy between a prescription and a cheque. A cheque is written to empower a banker to pay a certain sum of money to a certain person; a prescription is written to empower a chemist to prepare a certain medicament for a certain person. When the cheque has been presented and cashed, it becomes invalid and useless; it is retained by the banker though it remains the property of the drawer and may be returned to him if required as a voucher of receipt. When a prescription has been made up, the document is sometimes retained by the chemist, but is usually returned to the patient. If it were still of any use to the prescriber I have no doubt that he would claim it and have it restored to him; but it would be to him valueless, only waste paper. There is some reason for the chemist to retain it, in case any doubt might arise as to the correctness of the writing or of the dispensing of it, although a copy, which he usually makes, is almost always sufficient. But on the whole, unless it be destroyed, it is perhaps best for the patient to retain the document (though he must be prevented from misusing it), as he may want it made up first in one place and then in another before its period expires, when it becomes as useless as the cashed cheque. Also he may sometimes have occasion to refer to it on subsequent occasions—e.g., to show to another medical man what treatment he had received before. For instance, some time ago I was treating a patient with pot. iodid. in moderate doses with moderate success; he told me that he had previously derived much benefit from very large doses. I acted on the hint with complete success.

I think that Mr. Gadd suggests the best road out of the difficulty, and one which, if generally followed, will lead to success. The proper way to limit the time of the prescription (after which it is, or should be, as dead as a cashed cheque) is, I believe, that which I have adopted for some time and to which I alluded in a letter published in

[1] B. G. A. Moynihan: Duodenal Ulcer, p. 108; London, 1910.
[2] THE LANCET, Oct. 1st, 1910.

THE LANCET on Oct. 31st, 1908—viz., to print conspicuously on the face of every prescription, "Not to be repeated after ..... days." This seems to be quite in accordance with Mr. Gadd's ideas, when he speaks of "the directions on the face of a prescription" which pharmacists would "respect and faithfully observe." This direction of a time-limit ought, I maintain, to be given on every prescription. If generally adopted its propriety would be readily acknowledged. A direction, "Rep. ad lib.," would be an exception. Limitation as to time would also almost entirely prevent transference of a prescription to others—e.g., in such a case as this: A patient has a prescription given to him (or her) by a physician in England; he afterwards comes to Australia and has it repeatedly made up there and distributes it among his (or, of course, usually *her*) friends, some of whom it may suit, others may be unaffected, to others it may be noxious. Thus it would be hardly necessary to express a limitation to the individual patient on the face of the prescription.

If a prescription is seized and made improper use of by a quack the way to deal with such action is by an Act for the suppression or limitation of quackery. There is another point wherein I think that prescriptions should be improved by greater strictness. Instead of having a mere unrecognisable hieroglyphic representing the initials of the prescriber, who is possibly and probably quite unknown to the dispenser, his name, titles, and address ought to be written or printed plainly on the face of the prescription, so that he may be identified.

I am, Sir, yours faithfully,

F. LUCAS BENHAM, M.D., B.S. Lond., M.R.C.P. Lond.

Exeter, South Australia, Nov. 1st, 1910.

POLYDACTYLISM AND HEREDITY.

To the Editor of THE LANCET.

SIR,—The following cases of polydactylism may be of interest to your readers. A woman, aged 40 years, who had an extra finger on each hand and an extra toe on each foot, had six children, all girls. Five of these showed the deformity in a greater or less degree. Given in order of age they were affected: (1) right hand and left foot; (2) both feet; (3) both feet and both hands; (4) both feet and both hands; (5) right hand and left foot; the sixth child showed no signs of deformity, and there was no history of any of the relatives of either the mother or father having showed signs of the condition.

I am, Sir, yours faithfully,

South Shields, Dec. 3rd, 1910. A. BANKS RAFFLE.

INVALIDITY INSURANCE.

To the Editor of THE LANCET.

SIR,—The question of invalidity insurance for the industrial classes is very much in the public mind just now owing to the announcement that the present Government, if returned to office after the election, will introduce such a scheme in the next session of Parliament; and while it is not my purpose to contribute directly to the discussion of such a scheme, indirectly some facts, which have emerged in the course of my own experience, may prove of more than passing interest to medical men.

It is a striking fact that while mortality is improving invalidity is increasing. The improvement in mortality has been accounted for as follows: (1) the increased protection afforded to infant life; (2) the improvements in sanitary science, which have done much towards averting epidemics and enabling communities to deal more intelligently and efficiently with them when they occur; and (3) the great advances in medical and surgical skill, and the improved treatment of sick at home and in hospitals, which have saved vast numbers from attacks which would otherwise have proved fatal.

The natural conclusion to be drawn from the improvement in mortality would be that there was also less sickness, but it is an indisputable fact that sickness is actually on the increase. It may be that knowledge of the science of public health is teaching men to take precautionary measures, and that one result of these precautions is that people now lie up where previously they would have continued at work. On this assumption there would obviously be, in the first place, an increase in the rate of sickness, and, in the second, a reduced rate of mortality, if only on the principle that "a stitch in time saves nine."

The company with which I am associated originated a system of sickness insurance for professional and business men some 25 years ago, and has therefore acquired a somewhat unique experience in this department, and the privilege I enjoy of access to their records has enabled me to compile some valuable figures, which go to show that one week of sickness benefit per annum becomes payable to every member assured between the ages of 20 and 35. Between ages 45 and 50 this payment is increased to two weeks per annum. Between 55 and 60 it works out at over four weeks per annum, and between 60 and 65 to over six weeks per annum. Then nearly 25 per cent. of the members assured are incapacitated for one week at least in each year between the ages of 20 and 40, and this increases steadily until it reaches 40 per cent. between the ages of 60 and 65.

Another feature brought out by an examination of the experience referred to is that of the average number of weeks' pay made to each member who is sick during each year. From 20 to 25 this amounts to nearly four weeks; from 40 to 45 the duration has grown to rather over six weeks; from 50 to 55 it is more than nine weeks; and from 60 to 65 the average duration of sickness is just under 16 weeks.

These figures tell their own story, one part of which is that no system of invalidity insurance can be thoroughly sound unless either the rates of premium increase with the increase in age, in which event they would be prohibitive in the later years of life, or, secondly, a fixed premium is charged. This, like a life premium, must be something more in the early ages than is required for the claims at those ages, the balance being accumulated securely at compound interest, so that the heavier sickness of later life may be met out of this source without an increase in the annual contribution. I imagine that both actuaries and medical men will watch with great interest a development so interesting as that foreshadowed in the Government programme.

I am, Sir, yours faithfully,

W. A. ROBERTSON, F.F.A.,
Actuary, Century Insurance Company, Edinburgh.

Nov. 25th, 1910.

A CORRECTION.

To the Editor of THE LANCET.

SIR,—The remarks which you kindly made in reference to my work in Suffolk in connexion with the epizootic of plague on p. 1568 of your issue of Nov. 26th err in one particular. In fairness to the gentleman holding the post I ought to tell you that I am not the assistant medical officer of health for Ipswich. Prior to the appointment of an assistant I undertook the work of the medical officer of health in his absence, but now, apart from my appointment by the East Suffolk county council, the only official position I hold is that of bacteriologist to the East Suffolk and Ipswich Hospital.

I am, Sir, yours faithfully,

Ipswich, Dec. 2nd, 1910. H. LLEWELLYN HEATH.

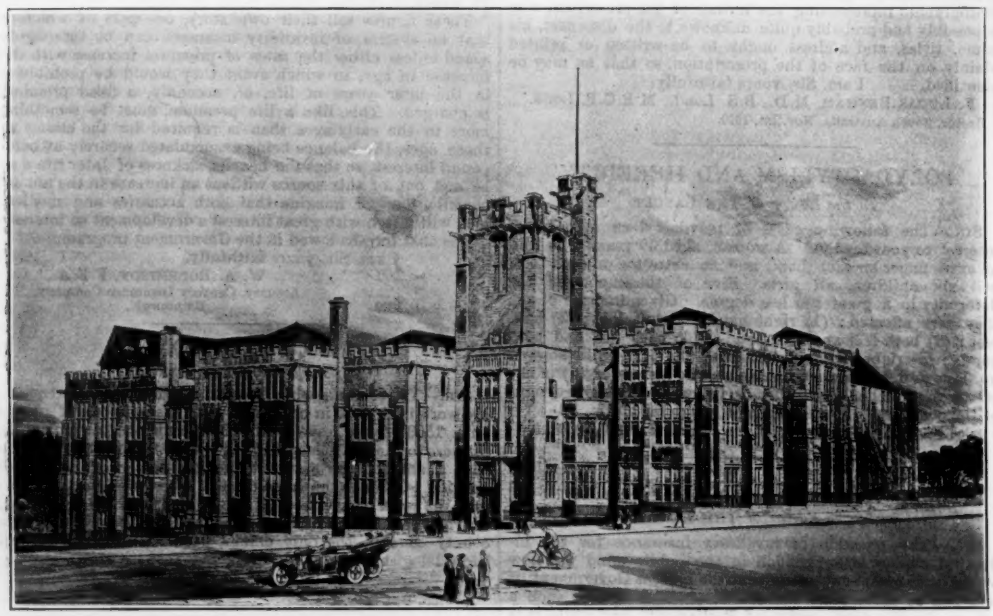
METROPOLITAN HOSPITAL SUNDAY FUND.—Under the presidency of the Lord Mayor, the Right Hon. Sir Thomas Vezey Strong, a council meeting of this Fund was held at the Mansion House on Nov. 30th, when the report for the year 1910 was ordered to be published. The report states that the total collection amounted to £71,550, of which £40,778 were collected in places of worship, £1635 more than in 1909. On the motion of Archdeacon Sinclair, the sum allotted by the Fund to the purchase of surgical appliances was raised from 5 per cent. to 7½ per cent. Referring to the subject of cinematograph shows, Archdeacon Sinclair said that pending the appeal in a certain case by the London County Council with regard to the licensing of these exhibitions, the Fund could not arrive at a decision with regard to these shows being held on Sundays for the benefit of hospitals. He thought, however, that the subcommittee which had the matter in hand would arrive at a satisfactory decision. It was agreed by the council to recommend that the sum of £100 should be voted to the secretary, Sir Edmund Hay Currie, who is suffering from bronchitis, to enable him to take a holiday abroad, and the sum of £20 towards a testimonial to Mr. Cole of the Christian Evidence Society. The annual meeting of the Fund will be held on Dec. 16th.

THE NEW WING OF THE UNIVERSITY OF BRISTOL.

(FROM OUR SPECIAL CORRESPONDENT.)

THE large block of buildings which has just been completed and equipped at a cost of £50,000 was formally opened by Lord Winterstoke, Pro-Chancellor to the University, on Nov. 15th, and is a splendid pledge of the firmness with which those in authority mean to establish the University of Bristol. It is designed to hold the departments of chemistry and physiology, which have till now occupied inadequate quarters in the old building. The money has been provided by the £100,000 subscribed by Mr. H. O. Wills, the Chancellor of the University, out of which five chairs have also been endowed. The site is part of that obtained by purchase of the Blind Asylum and its grounds, and it adjoins that of the other buildings so closely that it has been possible to make the corridors of the older north wing continuous with those of the physiological section of the new wing. Further extensions are to be expected next year when the occupants of the Blind Asylum move. It should be remarked that the transference of physiology and chemistry from the old buildings to the new has set free much space for the use of other departments.

FIG. 1.



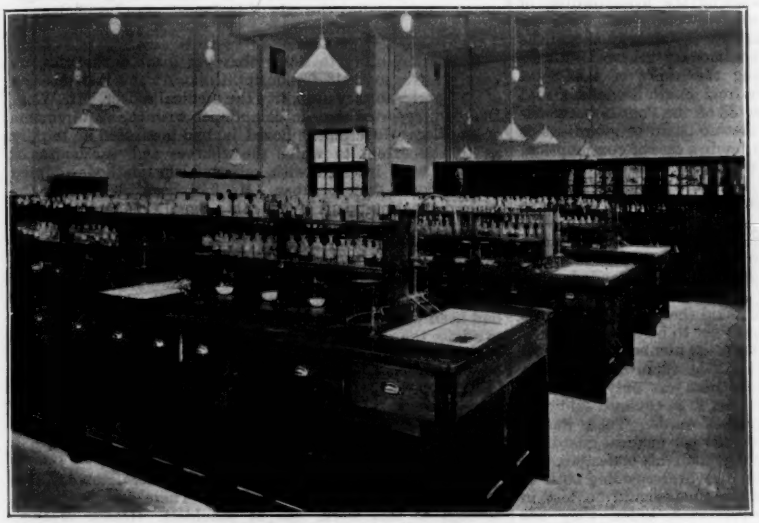
General elevation of the new wing of the University of Bristol.

Physiological department.—The designs for this department are the result of a careful examination of the physiological buildings of other universities. Professor A. F. Stanley Kent, in many instances in conjunction with the architects, has visited Oxford, Cambridge, Edinburgh, Glasgow, Manchester, Liverpool, Leeds, Sheffield, Strasburg, Freiburg, Nancy, and Lausanne. The accommodation thus provided is mainly in that part of the building which lies to the right of the tower in the accompanying elevation. (Fig. 1.) On the ground floor is a lecture theatre which will seat 150 students, with specially designed folding screens to carry diagrams, illuminated by electric light focussed on them. There is also an electric lantern for use with lantern slides, and a Zeiss electric projection apparatus for showing microscopical specimens. Adjoining this theatre are the professor's room, a museum and library, and a good preparation room. On the first floor the chief room is a students' laboratory of chemical physiology, illustrated in Fig. 2. Close to this is a large preparation room, with store and dark rooms; and another room on the same floor is devoted to the study of physiological optics, vision, photo-micrography, gas analysis, &c. On the second floor there is a large histological laboratory, in which a weaving-shed glass roof has been adopted in order to provide the maximum amount of illumination without allowing the direct entrance of sun rays. The accommodation in this room is increased by the addition of a gallery, in accordance with the plan followed at Cambridge. On this floor there are also a preparation room for histology and a large laboratory for the study of experimental physiology in the preparation room for the same purpose. At a little distance from these rooms, but still on the same floor, there are a demonstration theatre with a good top light and a preparation room serving it. A galvanometer room, a research laboratory for the professor, and a small store are also situated on the second floor. Finally, in the basement are a room for the study of cardiac physiology, a subject with which Professor Stanley Kent's name is closely associated, a dark room, a constant temperature room, an incubator room, and a cold store. This department is therefore admirably equipped, not only for the teaching of elementary and advanced physiology in all its branches, but also for research.

Chemical department.—This department, consisting of a basement and two floors, contains working places for 200 students. In the basement are the main stores communicating by a lift with the preparation rooms for the lecture theatre and senior laboratories on the ground floor, and with the store room for the main laboratory on the first floor. The basement also contains a laboratory accommodating 20 students, specially arranged for candidates for the Diploma of Public Health and those studying the methods used by analytical chemists. In addition to special rooms for gas analysis and photo-chemistry, the main feature of this floor is a large metallurgical laboratory, provided with heavy electrical currents for electro-metallurgical investigation. The ground floor contains a lecture theatre seating 150 students (a magnificent room) and a lecture room, each having its own preparation room. There is also a museum containing, among other things, a very complete collection of synthetic dyes. The senior laboratories and balance room are on the same floor, and the professor's private room and laboratory

divide the organic laboratory from that for physical chemistry, so that the professor is in close touch with his advanced students. On the first floor the principal room is the junior laboratory (Fig. 3), in which 80 students can work at the same time. There is a chemical library on the same floor, also a small laboratory specially designed and equipped for the investigation of problems connected with agricultural chemistry.

FIG. 2.

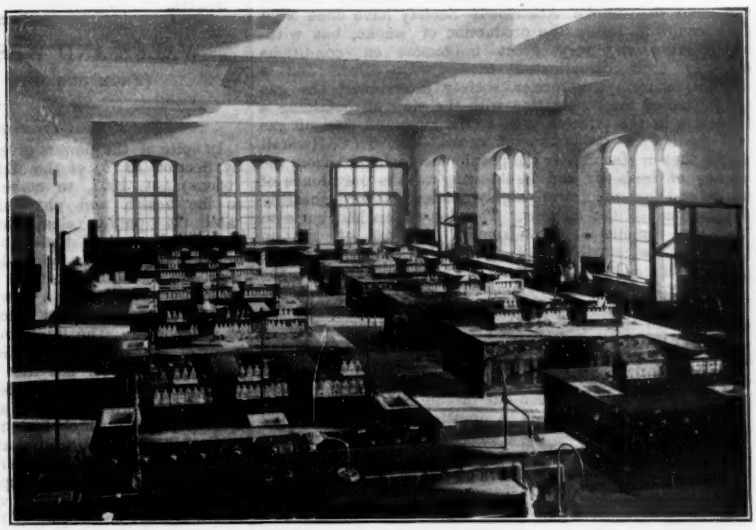


The Laboratory of Chemical Physiology.

General design.—The new wing is as large as the block of buildings which has up to now served all the departments of the University excepting those of the Faculty of Medicine. As has been already mentioned, it is continuous with the old block, the ground floor of the one communicating directly with that of the other; but the new wing is on sloping ground and at a slightly lower level than the old wing. It is this circumstance which has made possible the construction of a well-lighted basement. The new wing provides the University with a new frontage on Woodland-road, on the other side of which the new Baptist College (itself in affiliation with the University) is to stand. The main entrance from this side is at the foot of the tower; it opens upon the staircase running up from the basement to the tower and supplying both departments. Each landing communicates with two corridors, one running through a floor of the chemical department and the other through a floor of the physiological department. Architecturally it is an imposing pile of buildings, and the tower is a striking feature in a city of towers and spires, for the University stands on the slopes of a hill near the summit at which the fort of Prince Rupert's time stood, and overlooks the western half of the city. The external walls are of red pennant stone, and Box ground stone has been freely used for the dressed stonework. The floors, which are fireproof, are of steel and concrete; in some instances armoured concrete has been used. For the most part the internal partitions are capable of removal without involving constructional changes. The joinery is of Oregon pine, oak having been used to a small extent. The buildings are warmed throughout with hot water upon the low-pressure principle with accelerated circulation, Haden's patent "Turbo" accelerator being used. The building is lighted very thoroughly throughout by electricity, and all the laboratories are wired for experimental purposes. The ventilation is effected by means of powerful fans; the main fan is situated in the upper portion of the tower. Several systems of draught flues are also provided in connexion with the various benches, fume cupboards, and other fittings in the laboratories, each of them having its own fan.

The general solidity of the building and the harmonious scheme of external design reflect the greatest credit on the architects, Messrs. Oatley and Lawrence of Bristol. The works have been carried out in less than 12 months by the builders, Messrs. Cowlin and Son, also a Bristol firm. The whole building is manifestly the outcome of a generous conception of the functions of a modern university, coupled with efficient and laborious execution of details; and it pledges those who control the general policy of the University, both now and in the future, to large ideas and thorough work.

FIG. 3.



The Junior Chemical Laboratory.

The photographs, specially taken for THE LANCET, are by Mr. Frank Marsh, Whiteladies-road, Clifton; the plan of the elevation was kindly lent for photographic purposes by the architects.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

Workhouse Accommodation.

THE various boards of guardians of Manchester are still discussing the best way of lessening the overcrowding of their hospitals. In the Manchester township last week the question arose as to whether or not the guardians had the power of detaining cases of "pulmonary tuberculosis with expectoration." Notwithstanding the reply of the Local Government Board to an inquiry from South Stoneham, that it could be done under Section 22 of the Poor-law Amendment Act, 1868, the clerk said that no board of guardians or any other authority had power to detain a case of consumption, while one member of the board remarked, "the guardians are absolutely powerless in one of the most appalling parts of their work." At the meeting of the South Manchester guardians on Nov. 25th the overcrowded state of the children's ward at the hospital was brought up. The workhouse committee had recommended that a children's hospital should be built with 300 beds, and so arranged as to be easily extended. This was discussed *pro* and *con.*, but on the motion of Mr. F. B. Hargreaves was referred back. He said that many of the beds were occupied by cases which ought not to be there. Another difficulty they have to contend with is the number of phthisical cases under their charge. At present there are 141 male and 77 female consumptives, while there was only provision made for 96 men and 36 women. Dr. T. N. Orchard said that 59 cases were distributed among other wards. There was no isolation of phthisis. Dr. Garrett, another medical guardian, took a more serious view apparently than his colleague, and there can be no doubt that there is overcrowding both of children and consumptives, and no time should be lost in remedying the evil. In the Prestwich union they are troubled with an excess of lunatics, who are not fit to go out, and for whom no room can be got elsewhere. No help is to be obtained from the Prestwich Asylum, for that is also overcrowded. All this reveals a very serious state of affairs.

Value of Light.

"November is a dark month at the best, and if, as in Manchester, the darkness is intensified by the black pall of smoke that broods over the city, it only needs the addition of an atmospheric fog to convert the city into something terror-exciting, something only fitted for the wanderings of lost souls. The Manchester and Salford Sanitary Association and the Smoke Abatement Society have done what they could to lessen the production of smoke, but without making any very great impression on conditions due to such complicated causes. On Dec. 2nd a deputation from the former society interviewed the gas committee of the corporation with the view of obtaining a reduction in the price of gas, as the increased use of gas will modify the production of smoke. Mr. T. C. Horsfall urged that in Manchester the people were debarred from the agency of fresh air and light owing to the prevalence of smoke and fog, which were highly detrimental to the healthy development of the citizens. The deputation had come to beg the committee to encourage the use of gas in place of the small smoky fires by a reduction in its price. Sir Alfred Hopkinson, Vice-Chancellor of the University of Manchester, supported these views, and hoped that the magistrates would deal with gradually increasing severity with those responsible for the production of black smoke. Others of the deputation spoke, but without producing any very perceptible impression on the chairman of the gas committee. He was sympathetic, but pointed out that he had to find £50,000 a year out of the gas profits for the relief of the rates. It is a question worth considering whether it would not be more economical in the long run to improve the public health by spending this money in cheapening the price of gas rather than in relieving the rates, which relief, by the way, is shared by the non-users of gas. An improved public health is a splendid economy for a community.

"Slink" Meat.

There must be a roaring trade in "slink" meat in our large towns if what came to light in Preston the other day may be taken as a fair illustration. During the past few weeks no less than 7106 pounds had been ordered to be destroyed by the meat inspector. Dr. Brown, chairman of the health committee, said that a large amount of the meat was brought into the town, but the authorities knew those who dealt in doubtful meat, all of which was strictly inspected. In Cheshire there are, or were quite recently, men who were well known to be nothing but "slink" butchers. They apparently went openly about their business, none making them afraid, which looks as if the present legal prosecutions against the sale of bad meat were insufficient.

Plague Precaution.

It is satisfactory to know that our local authorities are keenly alive to their responsibilities. At the last meeting of the port sanitary authority the medical officer, Mr. W. F. Dearden, reported that in compliance with the requirements of the Local Government Board he had instituted an inquiry as to the extent to which the wharves and warehouses of the port were infested with rats and the methods adopted to keep down their number. He had been assisted by the general superintendent of the Ship Canal Company. It was ascertained that since the practice of keeping cats in the warehouses had been adopted the number of rats had been considerably kept down; that they were very seldom noticed in the transit sheds, and that no dead rats were found among cargo. The Ship Canal Company and all others concerned had been warned to keep a sharp look-out for dead rats, and to advise the medical officer of any unusual mortality among them. If rats were absolutely exterminated, which is a very distant possibility, the purpose of their existence might be revealed to us. Their disappearance, it seems, would result in no dangerous disturbance of Nature's scheme, but is it not certain that the pulex would then find another host?

The Manchester Hospital for Incurables.

The annual meeting of the Manchester Hospital for Incurables was held on Nov. 30th. There are two homes devoted to this work, one at Mauldett, Heaton Mersey, and the other at Walmersley House, near Bury. Of these patients 102 are free, while there are 16 for whom full or partial payment is made. There are also 12 pensioners who receive £20 a year. Those who visit the homes testify to the comfort and to the surprising cheerfulness of the patients, for whom the prospect must be inexpressibly sad. Being a most useful and humane, as well as a charitable institution, one looks, unfortunately, but too often quite as a matter of course, for an adverse balance-sheet. In this case, happily, it is not more than £335. All should sympathise in such work and the deficit ought immediately to be wiped out.

Dec. 6th.

WALES AND WESTERN COUNTIES.

(FROM OUR OWN CORRESPONDENTS.)

The Medical Treatment of School Children.

IN spite of the powers given to local education authorities by Section 13 (*b*) of the Education (Administrative Provisions) Act, 1907, to make arrangements for attending to the health and physical condition of children educated in public elementary schools, few authorities have made use of their powers. As a result a large number of children found defective on medical examination are being treated in the general hospitals. The governing bodies of a few of these institutions have protested, more or less successfully, against the adoption of this course. The latest to do so is the board of management of the Herefordshire General Hospital, who passed a resolution on Dec. 3rd that after June 30th, 1911, such children would not be eligible for treatment at the hospital. This decision was arrived at after the board had considered a memorandum which had been drawn up by the medical staff of the hospital. In that memorandum it was pointed out that the object of voluntary hospitals should be to relieve that large body of poor people who were just above those whom the local authorities were empowered by the Legislature to treat out of public funds, and yet who were not in a position to pay for special or costly treatment by their own medical man. It was further pointed out that neither the money of subscribers nor the endowments of hospitals were ever intended to relieve the rates by doing the work either of the Poor-law or education authorities, so that these bodies, in attempting to make use of such a charity as a hospital

to meet their responsibilities, were apparently hoping that custom would in time force upon the hospital authorities the duty of providing for these patients. An attempt was thus being made to make one class of the community work for the rest without payment, and in the opinion of the medical practitioners in the county such an attempt should be resisted. As regards the right of the board to refuse admission to those children who presented letters of recommendation from subscribers, the staff reminded the board that already restrictions existed and that treatment was refused to parturient women, consumptive patients, infectious cases, cases for dental treatment (except for extraction), and lunatics. The memorandum concluded by stating that by continuing to treat these children, whose treatment should be paid for by the State, the board would be incurring the hostility of the general practitioners in the county, some of whom had repeatedly reproached the hospital staff for assisting in the carrying out of such gratuitous treatment as that indicated.

The Inspection of School Children: a Parent Fined.

At the Bridgwater county petty sessions held on Nov. 28th a man was charged "with having wilfully neglected his daughter, aged 7 years, in a manner likely to cause her unnecessary suffering, or injury to health, including injury to eyesight." Evidence showed that the defendant, who resided in a neighbouring village, had been given repeated notice to send his child to Bridgwater to be examined by the ophthalmic surgeon of the Somerset education committee, the girl's eyesight being very defective. The defendant ignored every notice sent to him, and medical evidence showed that spectacles were urgently required. A fine of £2 and costs was imposed. This is the first prosecution of the kind instituted by the Somerset county council.

The Care of Imbeciles.

At a meeting held at Devizes on Nov. 21st, when representatives of nearly all the Wiltshire guardians were present, it was decided to approach the Local Government Board with the suggestion that special institutions, distinct from asylums, should be provided, in which all imbeciles should be treated. Mr. Thompson, the Local Government Board inspector, who was present, stated that the Local Government Board would give every assistance in promoting the scheme. After some discussion a deputation was appointed to interview Mr. Davey at the Local Government Board upon the matter.

The Didworthy Dispensary for Tuberculosis and Diseases of the Lungs, Plymouth.

The Didworthy Dispensary for Tuberculosis which has been established in Frankfort-street, Plymouth, was opened on Dec. 5th. The institution is for the poor and needy, and no ticket of recommendation will be required, the medical officer giving gratuitous service. Early cases of consumption will be sent to Didworthy, whilst advanced cases of the disease will be followed up at their homes by nurses. The financial support of the dispensary has been satisfactory, and up to the present about £160 have been received, which will be sufficient to carry on the work for the first 12 months. The Earl of Mount Edgcumbe has given £20 and Mr. Waldorf Astor £100, with an additional £100 for the distribution of literature bearing upon tuberculosis.

Workhouse Accommodation in Carnarvon Union.

The accommodation for the sick in the Carnarvon union has for a long time been unsatisfactory. Little or no classification is at all possible, so that consumptives, imbeciles, and other cases of sickness are treated in the same building. The only way in which real improvement can be effected appears to be by providing a new infirmary with modern equipment, and at a recent meeting of the board of guardians this course was urged by Mr. Hugh Williams, the Poor-law inspector for Wales, and Mr. B. T. Kitchen, the architect of the Local Government Board. Several guardians, however, advocated certain alterations to the existing infirmary building, and by a majority of three votes this proposal was adopted. At a further stage of the meeting it was decided to postpone the whole matter indefinitely in view of possible legislation with regard to the administration of the Poor-law generally. It is hardly likely that the Local Government Board will be satisfied with this unsatisfactory conclusion. The Abergavenny board of guardians has been threatened by the central authority with dissolution unless it provides better accommodation for its sick poor, and if the same course were adopted with respect to the Carnarvon board the members might perhaps reconsider their ill-advised decision.

Medical Officer of Health for Cardiganshire.

The county council of Cardigan has decided to appoint a medical officer of health at its meeting in February next. The salary has been fixed at £450 per annum, and the person appointed is to pay his own travelling expenses. The duties of the office will include those of school medical officer, and candidates for the appointment must be able to speak Welsh. Inadequate as this salary is, an attempt was made, though without success, to reduce it to £400 per annum. The population of Cardiganshire at the last census was 60,237, and the area is 440,630 acres.

Bristol Medical School Dinner.

The annual dinner of the Bristol Medical School was held on Nov. 29th at the Royal Hotel, Clifton, under the presidency of Mr. James Taylor. The guest of the evening was Sir Alfred Keogh, and there was a large attendance. Sir Alfred Keogh, who received a most enthusiastic reception, in the course of an interesting speech dealing with the work of the Royal Army Medical Corps, stated that he considered the Royal Army Medical Corps was highly efficient and doing a great work for science.

Death of Dr. Richard Mathias.

Through the death on Nov. 22nd of Dr. Richard Mathias of Radyr, near Pontypridd, a promising career has been prematurely cut short at the early age of 42 years. Graduating in arts at Cambridge in 1893, Richard Mathias later entered the medical school of Guy's Hospital and took the double qualification of the London Colleges in 1896, subsequently graduating in medicine at his university. In 1899 he succeeded to a practice at Radyr and Taff's Well, a district situated midway between Cardiff and Pontypridd. His family connexions were largely interested in the industries of the locality, but, quite apart from any advantage which this might be to him, his professional skill soon secured for him the confidence of his patients, while his kindliness and generous thoughtfulness for others made him popular with all classes. He leaves a widow and one child to mourn their loss.

Dec. 6th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Voluntary Health Visitors of the City of Edinburgh.

THE question of the prevention of infantile mortality has been vigorously taken up in most of the large cities of the kingdom, and many organisations have arisen the object of which is the remedying of this evil. Among these, the body known as the Voluntary Health Visitors of the City of Edinburgh takes a high place, both on account of the results of the work and the efficiency of the organisation. In the beginning of 1908 the Charity Organisation Society appointed a subcommittee to consider the various possible methods of dealing with infantile mortality in Edinburgh, and as a result, with the coöperation of the medical officer of health, the band of Voluntary Health Visitors was organised and began work in the end of 1908. The work, though voluntary, is done in connexion with the Public Health Department and under the inspection of the medical officer of health, Dr. A. Maxwell Williamson. When the work was taken up the public health committee of the town council appointed one salaried health visitor, whose duty it is to pay the first visit as soon as possible after notification of the birth. Only the very poor families are visited—of the class in which there is no family doctor. After the first visit has been paid the official health visitor hands on the name of the case to the secretaries of the voluntary health visitors, and then these visitors undertake the supervision of the infant for the first year of life. The visitors now number between 250 and 300, and the cases under visitation number over 1590. The city is worked in 70 districts, the visitors being supervised by captains who have charge of one or more districts, the whole work being organised by the honorary secretaries, Mrs. Somerville and Mrs. Hamilton Maxwell. The visitors are supplied with printed forms on which they fill in particulars as to

the condition of each infant under their care. They are required to report in this way fortnightly, the forms being sent in to the medical officer of health. Infants of Roman Catholic parents are undertaken by Roman Catholic visitors, and Protestants by Protestant. When the work was initiated it was endeavoured, so far as possible, to make use of visitors already at work in the district, their numbers being supplemented whenever necessary. In spite of the tradition that the work of voluntary workers cannot be depended on to last, the character of the work of the voluntary health visitors of Edinburgh has, on the whole, improved in quality during the two years of their existence. Notwithstanding the very considerable amount of trouble involved in the visiting and in the filling up and sending in of the fortnightly reports the work is being done with commendable regularity, and in only a small number of cases has the reporting been done irregularly. The credit of this must partly be given to the able manner in which the honorary secretaries organise the work and keep alive the interest of the visitors in the scheme. Short courses of lectures are arranged for the visitors during the year. The lecture courses for this winter are: (1) a preparatory course of six lectures by Mrs. B. Russell, L.R.C.P. & S. Edin., M.D. Brux.; (2) a short course of lectures, by Dr. R. W. Philip, on Tuberculosis; and (3) five lectures, by Mrs. George Kerr, honorary secretary City of Edinburgh Charity Organisation Society, on Training for Service. A fee of 2*s.* 6*d.* is charged for each course of lectures. Small handbooks are given to the visitors, furnishing information with regard to medical and other charities in the city, the aim being to educate the visitors in all matters touching their work. The expenses to the city of the Voluntary Health Visitors amounted in 1908 to between £11 and £12. This sum did not include stationery which was supplied by the Public Health Department. The fees to lecturers were defrayed by the sale of lecture tickets to the visitors. The expenses to the city this year will amount, it is expected, to not more than £20, the increase being partly due to the increase in the work and partly to the expense of the forms for the fortnightly reports, which were introduced since the beginning of the year. For the amount of work done—the visiting and fortnightly reporting on nearly 1600 infants—this expense is remarkably small, and is interesting as showing what resources in the way of purely voluntary work may be called into activity provided efficient organisers are found. Edinburgh is rich in hospitals and dispensaries and visitors are kept well informed as to where they may send their cases for medical and surgical advice. A weekly consultation is held in connexion with the out-patient department of the hospice where visitors may send infants to be weighed, and two of the voluntary health visitors undertake to weigh at their houses infants who cannot be taken out for this purpose. At the hospice a milk depôt is worked on a small scale. In connexion with the Voluntary Health Visitors' organisation a cradle committee manufactures cradles out of banana crates, which are sold to the mothers at 1*s.* 6*d.* each, and another committee provides baby clothing which is sold to the people at low rates, and cooking classes are arranged for the mothers. A fortnightly visitors' meeting lasting for one hour is held in the City Chambers, when reports from the various committees and from the hospice are read. The secretaries also endeavour to arrange for a short address to be given at each meeting on some particular branch of social work. As to the results, the only figures yet available are those relating to the first year of the work, 1909, as given in the annual report of the medical officer of health. Infantile mortality in Edinburgh has never reached so high a figure as in many of the large manufacturing towns. In 1908, before the present work was begun, the rate was 114 per 1000 births. In 1909 the rate fell to 113. At first sight the decrease was small, but, as Dr. Maxwell Williamson pointed out when addressing the visitors on the subject, the rate was undoubtedly kept up in 1909 by a high mortality from zymotic diseases, notably in pertussis. In the deaths classified as due to diarrhœal and digestive disorders, in which direction, presumably, the effect of the work of the health visitor would most clearly be seen, there was a marked reduction, the figures being 77 deaths in 1909, against 113 in 1908, while the deaths under one year classified as due to starvation, malnutrition, atrophy, debility, and marasmus fell from 111 in 1908 to 75 in 1909. In the areas marked by the medical officer of health as being those in which the conditions were most adverse, and where the mortality in 1908 was calculated as 160 per 1000 births, there was a reduction in 1909 to 154 per 1000 births, while deaths from overlying, which numbered 18 in 1908, fell to 11 in 1909. In the present year the mortality so far has been under 100 per 1000 births, and unless in the last two months of the year there is an unusually high death-rate the figures for the year should show great improvement.

Statistical Report of Glasgow University.

The secretary of the University Court has just issued the report of statistics, &c., relative to the University of Glasgow for the academical year from Oct. 1st, 1909, to Sept. 30th, 1910. The report shows that the teaching staff consisted of 32 professors, 54 lecturers, and 88 assistants and demonstrators. The salaries paid to the principal and professors amounted in all to £26,512 7*s.* 1*d.*, to lecturers £8217 4*s.* 8*d.*, and to assistants and demonstrators to £9747 3*s.* 10*d.* Pensions amounting to £4935 2*s.* 6*d.* were paid to retired professors. During the year the total number of matriculated students was 2728 (including 642 women), as compared with 2699 (including 695 women) for the preceding year. Of these 1264 (including 534 women) were enrolled in the Faculty of Arts, 449 (including 24 women) in the Faculty of Science, 61 (including 1 woman) in the Faculty of Theology, 701 (including 71 women) in the Faculty of Medicine, 204 in the Faculty of Law, and 49 (including 12 women) in a single class. The following degrees were granted in medicine:—M.D.: With high commendation, 2; with commendation, 4; ordinary, 9. M.B., Ch.B.: With honours, 3; with commendation, 7; ordinary, 84. The total degrees in medicine were thus 109.

Dec. 5th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Congress of the Royal Institute of Public Health.

THE Congress of the Royal Institute of Public Health is to meet in Dublin next summer, and a meeting of citizens was held last week in the Mansion House, under the presidency of the Lord Mayor, to make preliminary arrangements. An influential local committee was formed, and it was decided to invite Lord Iveagh to accept the presidency of the congress. No better choice could have been made, for Lord Iveagh, besides being head of Messrs. A. Guinness and Co., the greatest employers of labour in Dublin, has shown a practical interest in the housing of the poor both in Dublin and London. He has provided the funds for clearing various slum areas and substituting modern blocks for the old rookeries.

Dublin City Bacteriologist.

A position of some interest has arisen in connexion with the appointment of a bacteriologist for the city of Dublin. The choice of the corporation fell on Dr. M. J. Russell, medical officer to one of the city dispensaries. The appointment is, however, subject to the sanction of the Local Government Board, and this has been refused. In a letter to the corporation the Local Government Board remark that Dr. Russell, owing to other engagements, "could not be in a position to undertake the very responsible duty of advising the corporation of Dublin on a subject which requires close and unremitting work in the laboratory;" and that "it is, in the Board's opinion, essential that if the person appointed is to command the confidence of the public and of the medical profession he should devote his time largely, if not entirely, to bacteriological work.

A Well-fought Election.

For some weeks past much interest has been taken in the neighbourhood in the election of a medical officer for Mountbellew Dispensary District in the county Galway. On two occasions the guardians met for the election, but on both the voting was equal between two candidates—Dr. O'Kelly and Mr. J. J. Egan. Only one guardian was absent, and one guardian who was sick was carried into the board room in a chair. The chairman has no casting vote, and therefore a third meeting had to be called. On this occasion there was a full board, and Dr. O'Kelly was elected by one vote. A

district inspector and eight constables were present to maintain the peace.

The Lord Chief Baron and Medical Evidence.

While summing up in a case heard before him last week the Lord Chief Baron Palles made some severe remarks as to the kind of medical evidence which, he believed, is given in the Irish courts. He said the conduct of the particular case had been very pleasant to him, for it was one arising out of railway injury but had not involved medical witnesses in that terrible difference of opinion which very often existed between them. Lord Chief Baron Palles is voicing the opinion of many members of the medical profession in suggesting that some of the "expert evidence" given in court is not creditable to the profession.

Royal Medical Benevolent Fund.

At the annual meeting of the Irish Medical Association in 1909 the president, Sir William Smyly, made an offer of a special donation of £20 to the Royal Medical Benevolent Fund on condition that at least half the medical practitioners of Ireland would contribute at the rate of one penny a week for the year 1910. At the meeting of the central committee of the fund last week the secretary had to report that only 790 out of 2200 medical practitioners in the country had contributed for the year 1910, and that the fund was therefore not in a position to claim Sir William Smyly's donation.

Belfast Board of Guardians.

At a meeting of the Belfast board of guardians, held on Nov. 29th, a strong resolution was passed protesting against the action of the Government in ordering a proportionate abatement of the sum payable in respect to the expenditure incurred by it for medical and educational purposes during the financial year ending March 31st, 1911. The guardians consider they are entitled to the standard amount of recoupment—in respect of medical and educational expenditure (£3942 16*s.* 11*d.*)—that has been paid in the past, otherwise the deficiency will fall on the ratepayers already overtaxed, or the guardians will have to give less assistance to the poor.

Health of Belfast.

The report of the medical officer of health of Belfast presented to the monthly meeting of the city corporation, held on Dec. 1st, showed that for the four weeks ended Nov. 12th 169 cases of infectious disease were notified, as compared with 121 in the preceding month, and 119 in the corresponding month of 1909. The increase applies to all notifiable diseases, the major portion being due to scarlet fever and erysipelas, of which 94 and 30 respectively were notified, as against 68 and 17 the previous month, and 61 and 27 in the corresponding period of 1909. 28 cases of tuberculosis of the lungs were notified. The epidemic of scarlet fever—though mild, fortunately—had so taxed the resources of the municipal fever hospital at Purdysburn that the board of guardians had to be asked to relieve the congestion by taking in cases to the union infirmary.

Ulster Medical Society.

At the second meeting of this society in this session, held in the Medical Institute, Belfast, on Dec. 1st, Dr. Cecil Shaw read a paper, "Making a Cure at a German Spa," illustrated by original photographs shown by the lantern. Mr. John O'Doherty read a paper on Tubercular Appendicitis and its Relation to Tabes Mesenterica. Dr. G. A. Hicks showed some specimens of Fibroid Tumours of the Uterus with Degenerative Changes.

Dec. 6th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Hypodermic Injection of a Mixture of Ether and Oil.

AT a meeting of the Therapeutical Society held on Nov. 23rd M. Gimbert spoke in favour of the hypodermic injection of a mixture of equal parts of ether and oil, the mixture to be made either at the time of using or else very shortly beforehand. He said that the puncture might be either subcutaneous or intramuscular, and that the operation was invariably very much less painful than the injection of ether by itself was to certain individuals; it might even cause no pain at all. Two cubic centimetres of the mixture might be given at a time, and this dose might be repeated from hour to hour. The principal action was that of a stimulant, the effect becoming apparent in from five to six minutes—i.e., perhaps less rapidly than with pure ether. The patient's pulse improved, he felt better, and had a sensation of warmth, the drowsiness and general distress diminished, and the respiration became regular.

Gynæcology in Madagascar.

At a recent meeting of the Société de l'Internat des Hôpitaux de Paris M. Fontoynont said that among the natives of Madagascar the cervix uteri frequently presented the peculiarity of a considerable hypertrophy of the anterior lip which might even extend as far as the vulva. This was, perhaps, a racial peculiarity, and it would be interesting to inquire if it existed among the Malays. Elephantiasis of the labia majora and labia minora was common; it was a result of syphilitic infection, and in appearance closely resembled elephantiasis of tuberculous origin, but differed from filarial elephantiasis. Coxalgia and Pott's disease were of extreme rarity. Gonorrhœal affections, although very prevalent, did not give rise to disease of either the uterus or the adnexa. The absence of restrictive measures and the desire to have children discouraged abortion, with the result that infections of the uterus and the adnexa due to abortifacient procedures were comparatively infrequent. Fibroma was not so common as in Europe; cancer of the uterus was rare, but was more often met with than cancer of the skin; cancer of the alimentary canal was quite unknown. Extra-uterine pregnancies formed the majority of the gynæcological conditions for which surgical operations were required. Malaria exercised an influence on most diseases; it might give rise to abortion, and the only way of preventing premature labour from this cause was the injection of quinine in a sufficient dose, such as a gramme or a gramme and a half.

Action for Damages against a Surgeon.

On Dec. 1st the Tribunal of the Seine decided a case in which a married woman claimed 50,000 francs damages from Dr. Bazy, who had operated on her in the Hôpital Beaujon for an abdominal cystic tumour in the year 1906. In the course of the operation, which was difficult and performed in circumstances of urgency, Dr. Bazy by an oversight left two cotton-wool compresses in the wound. The court was of opinion that he was to blame, but it had been proved (1) that the compresses thus left behind had not caused any material injury; and (2) that at the time of the operation the woman's health and even her life were seriously endangered; it was also very probable, if not positively certain, that without the operation she would not have been alive to-day. In these circumstances the court, considering a claim of 50,000 francs to be excessive, reduced the amount of damages to 5000 francs.

Treatment of Gonorrhœal Rheumatism.

In a communication made to the Société Médicale des Hôpitaux on Nov. 25th M. Louis Ramond and M. Chiray stated that five cases of acute or subacute gonorrhœal monoarthritis, which had been treated by the ordinary methods without benefit, had recovered completely under the use of the antimeningococcic serum of the Pasteur Institute. This serum was injected under the skin, either in the neighbourhood of the affected joint or at a distance from it, or even into the joint itself. A dose of 20 cubic centimetres was each time found sufficient to produce the almost immediate disappearance of the habitual painfulness of the part, the rapid absorption of the effusion both within and around the joint, and the cessation of the pain which had for a considerable time been felt on pressure. The serum treatment did not avert ankylosis in patients who presented themselves in a late stage of the illness, and the earlier it was applied the better prospect was there of the joint remaining useful. These cases fully confirmed the observations made by M. Pissavy and M. Chauvet, and showed that in gonorrhœal rheumatism injections of antimeningococcic serum were simple, effectual, and free from danger.

Action for Damages against a Pharmaceutical Chemist.

A recent decision of the Tribunal of the Seine has an important bearing on the responsibility of pharmaceutical

chemists in connexion with the treatment of patients. A woman cook who had injured her elbow by a fall went on the following day to a druggist, who gave her some preparation and strongly advised her to follow his treatment without consulting a medical practitioner. When eight days had passed without any abatement of the swelling the cook's mistress called in her own medical man, who found that the elbow was dislocated and that on account of the long delay it would be necessary to have a surgical operation, which was accordingly performed in two stages. The patient then brought an action against the druggist and was awarded 2000 francs damages.

Treatment of Syphilis.

At a meeting of the Société de Médecine de Paris held on Nov. 26th M. Lacapère said that the three principal remedial measures in use for syphilitic patients at the present time were as follows: (1) mercurial treatment, for which purpose he decidedly preferred the intravenous injection of soluble salts; (2) hypodermic injections of soluble mercurial salts, together with simultaneous injections of hectine, a method which has given excellent results; and (3) arsenical treatment, consisting in the intravenous injection of arsenobenzol in repeated small doses, a method of administration which was unquestionably superior to intramuscular injections.

Dec. 5th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Unqualified Practice.

THE various questions connected with unqualified practice continue to engage the attention of the medical profession in Germany, especially in view of the Bill on the subject which will be discussed in the present session of the German Parliament.[1] Dr. Reissig of Hamburg, writing to the *Berliner Klinische Wochenschrift*, gives some interesting particulars relative to unqualified practice. The authorities estimate the number of unqualified practitioners at about 10,000, but this is much too small, and the real number is believed to be between 12,000 and 15,000. The number of patients attended and the fees pocketed by certain quacks are truly enormous. Special trains are run by the railway companies to certain small places where celebrated quacks reside; an instance of this kind is provided by a shepherd named Ast, who lives near Hamburg, and attends as many as 500 patients a day. In other cases where the residence of the quack is at some distance from a railway station, a motor-car or omnibus service is provided for the conveyance of patients to his house and back to the station. Some quacks attend 20,000 patients a year, in addition to consultations and advice by letter. In an action-at-law brought against a quack named Norden-Köther, who had formerly been a chemist, his annual income from patients was stated to be 240,000 marks (£12,000). Several practitioners of the same description have incomes of more than 100,000 marks (£5000), and many have incomes between 20,000 and 70,000 marks. The shepherd above mentioned is said to be worth 3,000,000 marks (£150,000). Two quacks asked, and were paid, 10,000 marks (£500) for the treatment of a tuberculous knee-joint. A cook, suffering from incipient tuberculosis, had to pay 80 marks each visit for treatment by X rays; a woman suffering from cancer paid a quack 3080 marks, and, in addition, gave him her jewellery. A patient in humble circumstances who was visited by a quack at her own home had for each visit to pay 20 marks for the attendance, and from 7 to 10 marks for medicines, the total expenses being 475 marks at her death. Some patients had spent all their property for treatment by quacks, and some patients who were maintained by the Poor-law authorities and attended by the Poor-law medical officer, secretly consulted quacks and paid from 2 to 3 marks a visit out of the money distributed to them by the Poor-law officials. Certain quacks resort to the device of advertising gratuitous consultation, the result being that the patients do not pay for the "advice," but only for medicine, the latter having to be bought either from the quack himself or from some neighbouring druggist who is in league with him and charges from 20 to 25 marks for medicine worth not more than 5 marks, the difference being credited to the quack. One of this category intended to establish a special sanatorium for his patients when he was arrested for misdemeanour, and having been liberated on giving bail of 30,000 marks he forfeited his bail and made his escape to a foreign country. The majority of the quacks have no education; in Berlin, for instance, it was stated that only 24 per cent. of the men and 1 per cent. of the women had a college training. The list of quacks include all sorts and conditions of men, from clergymen to music-hall artists and from lawyers to carpenters. They usually declare that they have got their medical knowledge from books, but evidently the great majority of them are unable to understand what they may have read. Dr. Reissig gives some interesting samples of letters written by certain renowned quacks to show their low standard of education. Many of them are criminals who have served sentences, not for infringements of the existing laws and regulations concerning medical practice but partly for offences of a worse description. The list given by Dr. Reissig includes men convicted for burglary, for fraud, for extortion, for offences against morality, and for having caused death by negligence. In some cases these crimes were committed previously to, but in certain cases during, their medical practice. Sometimes the culprit resumed practice immediately after coming out of prison. The most remarkable case is that of a murderer who was sentenced to death in 1858, but whose sentence was commuted to confinement in a penitentiary. After a detention of 31 years he was liberated in 1889, when he began to practise medicine. A few years later he was prosecuted for having caused death by negligence in administering an overdose of morphine to a woman, but was acquitted by a jury. It is no wonder that attempts have been made by the representatives of the medical profession to amend the present state of the law, which allows any person whatever to practise medicine, provided that he is careful not to assume a title equivalent or similar to the special titles of duly qualified medical men. After many years of hesitation the Government at last gave a general approval to the proposals of the medical profession, and two years ago a Bill was introduced for the restriction of unqualified practice, but could not be discussed because of other urgent parliamentary business and the closing of the parliamentary session. The principal paragraphs of this Bill were described in THE LANCET of March 14th, 1908, p. 818. It may be remembered that they provided for a registration of unqualified practitioners; that these persons would have to keep books and inform the authorities as to their medical training; and that they would not be allowed either to treat patients by letter, or to attend venereal and infectious diseases, or to administer narcotic compounds. Unqualified persons who might be proved to have caused injury to the health of patients might also be debarred from practising, and the sale and the advertisement of patent medicines and remedies for venereal diseases were prohibited. This Bill is now re-introduced and the first reading is about to come on. The Bill is nearly the same as it was two years ago, some paragraphs excepted. A provision has been added to prohibit unqualified persons from mentioning their registration in their advertisements or on their door-plates. When the text of the former Bill was published the medical journals expressed the opinion that compulsory registration, instead of being a hindrance to unqualified persons, would rather raise them in the popular estimation, and that they would not fail to give the utmost publicity to their registration for the purpose of making their dupes believe that it was equivalent to a medical qualification. This is avoided by the above-mentioned clause. Another new clause specifies the diseases the treatment of which may only be undertaken by duly qualified medical men. In the former Bill the diseases were only the venereal and infectious diseases; the new Bill gives a detailed list of them, including cholera, small-pox, enteric fever, and cancer. A third new provision, which will certainly be very detrimental to quacks, is that they are to be forbidden to dispense medicine themselves or to give to their patients the address of a certain druggist or pharmaceutical chemist as the only vendor of the medicine prescribed. Two new provisions will be of special interest to foreign medical men; the one exempts foreign medical men from the prohibitions embodied in the law when they have been called to a consultation in Germany

[1] See THE LANCET, Dec. 3rd, p. 1650.

by a patient or a German medical man; the other empowers the Imperial Chancellor to dispense medical men holding foreign diplomas from the provisions of the law concerning the keeping of books and the treatment of certain diseases. Registration, however, is in every case compulsory for holders of foreign diplomas, and cannot be dispensed with by the Chancellor. The new Bill will certainly correct many of the abuses connected with quackery, and it may be accepted as satisfactory by the medical profession, especially since it is understood that the legislature is not at present disposed to take up the question of suppressing unqualified practice.

Twenty-eighth German Congress of Internal Medicine.

This Congress will take place next year from April 19th to 22nd at Wiesbaden, under the presidency of Professor Dr. Ludolf von Krehl of Heidelberg. The principal papers announced for the first day's proceedings are: Upon the Nature and Treatment of Diatheses, by Geh. Med. Rat. Professor Dr. Wilhelm His of Berlin, Professor Pfaundler of München, and Professor Bloch of Basel. Announcements of papers which it is intended to read must be sent, with a short abstract thereof, to the Secretary before March 22nd next. In connexion with the Congress there will be an exhibition of preparations, apparatus, and instruments so far as they relate to internal medicine. All applications must be made to the Secretary of the Congress, Geh. Sanitätsrat Dr. Emil Pfeiffer, Wiesbaden, Parkstrasse, 13.

Dec. 5th.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

The Health Department of Toronto.

AFTER a service of 18 years, Dr. Charles Sheard has again tendered his resignation of the position of medical health officer of Toronto, and Dr. Charles J. C. Hastings (Toronto) has been appointed to succeed him. Dr. Hastings two or three years ago organised the Milk Commission of the Canadian Medical Association, and since then has been its chairman. In connexion with the clean milk campaign he has been a strong influence throughout Canada in promoting the formation of branch commissions. He believes that all milk not certified should be properly pasteurised. For the Toronto Laboratory Dr. Hastings advised the appointment of Mr. G. G. Nasmith, Ph.D., of the Ontario Board of Health, and the city has made the appointment. Dr. Hastings will endeavour to bring the health of Toronto to the highest standard.

Hypochlorite Treatment of Water.

Just before leaving the laboratory of the Ontario Board of Health to assume the position of chief of the Toronto laboratory, Dr. Nasmith had made some investigations as to the treatment of water by chloride of lime, which he found of undoubted value. A special circular has been issued by the Board which will be particularly valuable to hunters, prospectors, and campers. In this it is set out that one level teaspoonful of chloride of lime dissolved in three cupfuls of water, and one teaspoonful of this solution added to two gallons of water, will render it free from bacteria and leave the water good for drinking.

Sepsis in Medicine.

Dr. William Hunter of the London (England) Fever Hospital, who came out to deliver the opening address of the Medical Faculty of McGill University, Montreal, came on to Toronto and gave an address to the Academy of Medicine. Dr. Hunter emphasised the importance of sepsis to the physician as well as to the surgeon, and said that they should be antiseptic physicians as well as antiseptic surgeons. He discussed the part which decayed teeth and pus formation in the gums played in the causation of anæmia, especially in pernicious anæmia, putting forward the view that pernicious anæmia is really a chronic infection.

Radium in the Treatment of Cancer.

Dr. Louis Wickham of Paris has also paid a visit to Montreal and Toronto recently, at the latter place being the guest of Dr. W. H. B. Aikins. A special meeting of the Academy of Medicine was arranged, at which Dr. Wickham gave an illustrated lecture on the use of radium in the treatment of cancer and other diseases, and on the selective action of radium. The meeting was largely attended and several practitioners came some distance from outside points.

The Complete Physicians.

The above was the title of Professor J. George Adami's address at the opening lecture of the present session at the Medical Department of the University of Toronto. Professor Adami had a good deal to say in his address about Bulletin No. IV. of the Carnegie Foundation. While McGill and Toronto had been referred to repeatedly in this report, they are apparently considered of a lower class compared with some institutions in the United States, which demand that, before a four years' course in medicine, at least two years should be spent at a university or college. Professor Adami discussed this matter by proposing two questions:—1. Are a college course and an arts degree essential for the complete physician? 2. Is the Carnegie Report justified in making the entrance requirements of the school the standard whereby to classify the medical schools of this continent? He does not urge two or three years in arts and five in the medical course, as prolonged training tends to make a man become stale. Professor Adami believes in the fifth year, now pretty generally a requirement in Canada, which year spent in a hospital will produce magnificent training. He thought the Halifax school had been unjustly criticised in the report.

Mortality from Consumption Decreasing in Montreal.

It was announced at the annual meeting of the Royal Edward Institute that during the past 12 months in Montreal the mortality from pulmonary tuberculosis had decreased by 67. Montreal is said by the President of the Institute to be still 50 per cent. ahead of Boston, New York, and other American cities in consumption mortality. In 1907 the deaths in Montreal from all forms of tuberculosis were 953; in 1908, 945; and in 1909, 845. The corresponding deaths from pulmonary tuberculosis were 748, 760, and 685. To the institute 431 new cases were reported during the year, and 836 patients attended the dispensary. The total number of consultations was 6004, and the number of visits made by the inspector was 4716. The total number of patients on the list was 773, of whom 300 have died, 48 were lost sight of, and 425 still remain for treatment. Lieutenant-Colonel Burland was re-elected President of the Institute, and Dr. E. P. Lachapelle as first vice-president.

Infant Mortality in Ontario.

The Ontario Government has caused to be prepared and published a special report on infant mortality throughout the province. This report was prepared by Dr. Helen MacMurchy (Toronto), who states that infant mortality is the greatest problem of preventive medicine. In Ontario, according to the thirty-eighth annual report of the Registrar-General for 1907, the total number of deaths was 35,502, and the number of deaths under 5 years of age was 9930—that is, 29 per cent. of the total. Compare with this the total deaths due to tuberculosis in 1907—namely, 2530, or 8 per cent. of the total. Whilst not enough work is done about tuberculosis, what is said or done about infant mortality? In the city of Toronto in 1907 there were 1313 deaths under one year of age, and the total number of births was 6680. This gives an infant mortality of 196 per 1000. These figures emphasise the need for an educational campaign in the province, as nearly 10,000 die annually in Ontario under 5 years of age.

Health Conference at Ottawa.

There was held recently in Ottawa, under the auspices of the Public Health Department of the Canadian Conservation Commission, an important conference of Federal and Provincial health officials. Different committees were formed and these subsequently made recommendations to the conference. The Committee on Pollution of Waterways recommends a law prohibiting and penalising the deposition of raw sewage in the waterways of Canada, and towards this end it presented a draft Bill for each province to give effect to, so that there shall be no conflict of jurisdiction between the Dominion and Provincial Governments. Legislatures are to be asked to insert a clause in their various Health Acts that no sewerage or water-works construction can be undertaken by any municipality until the approval of the Provincial Board of Health has been obtained. The Federal Government is advised to confer with the United States with a view of preventing any further pollution of international waterways. The report of

the Committee on Tuberculosis recommends that the Dominion Government should be urged to give substantial assistance to encourage the establishment of new sanatoriums and hospitals for consumptives. It also recommends that areas of Crown lands should be secured early, to be set apart for colonies of the tuberculous and their families. It was decided to recommend to the Government that a permanent National Council of Health should be established under the Conservation Commission, and also that a national public health laboratory should be established to manufacture vaccines, toxins, and antitoxins, and analogous products, and also to supervise the manufacture, sale, and importation of such products. An officer of the Commission will shortly be sent to the United States to study and to report upon the work and expenses of such laboratories.

Toronto, Nov. 28th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Sanitation in Eastern Bengal and Assam.

PERHAPS one of the most interesting and instructive reports issued by the Government of Eastern Bengal and Assam for 1909 is that dealing with sanitation. There seems to be a connexion between the birth-rate of one year and the general healthiness of the year immediately preceding it. In 1907 the mortality was the lowest recorded since the formation of the province. In 1908 the birth-rate was the highest. The slight fall in the birth-rate during the year under review (which, however, was higher than any other province except the Central Provinces) corresponds with the slight rise of mortality in 1908. Last year there were but two cases of plague and these cases were imported into the Province. The absence of plague seems to be due to two facts: first, that the people do not live in houses where the mus rattus can find an easy home. The roofs are, especially in Dacca, flat thatched and sometimes corrugated. The rat is unable to live and breed as it does in houses with tiled roofs. The second reason is that Eastern Bengal and Assam possesses so many rivers which overflow their banks, and this from a sanitary point of view is of high importance. "Fevers" (a most inexact term) account for many deaths, the mortality ostensibly being highest in the cold weather months of November and December and lowest in February. It is interesting to note that in the three districts in which vaccination has made least headway (Rangpur, Bogra, and Dinajpur) small-pox was greatest. The epidemic was traceable to Calcutta. The results of the Malaria Conference at Simla should lead to far-reaching results in the young province. The main recommendation, it will be remembered, was that anti-malarial measures on any large scale should always be preceded by a systematic investigation of the distribution of the disease and by a critical examination of vital statistics. The local government has already set to work on these lines, and the results, especially in such malarious districts as Jalpaiguri and Dinajpur, are awaited with considerable interest. It is disappointing to note that the vital statistics are still in an unsatisfactory way. Nothing ought to be done to weaken the obligation of the householder to report. There should be more checking, and prosecutions ought to be instituted by the vaccinating staff, who should be rewarded for convictions obtained. Without reliable statistics reform must always be a leap in the dark.

Medical Work in the Punjab.

Colonel A. L. F. Bate's report on the dispensaries and charitable institutions of the Punjab for 1909 shows the salient feature to be not so much the excellent work of these institutions as the clear indications of the gradual and steady extension of medical relief, and of the growing confidence of the masses in the Western system of medicine. This last point is especially borne out by the figures for the total number of patients of all classes. During the year, which was a healthy one on the whole and free from outbreaks of epidemics, except plague, over 4,511,751 persons were treated, only slightly fewer than the phenomenally large number in the previous year when a severe epidemic of malaria ravaged the Province. Moreover, the number of women and children attending the dispensaries during the year showed a considerable increase over the figures for the previous year, a fact which alone demonstrates that the people are more ready to resort to these institutions in cases of illness than formerly. Special efforts are being made to recruit suitable lady doctors, and there are now five female assistant surgeons and 11 female hospital assistants working in the hospitals and dispensaries, which is a satisfactory advance. The Lieutenant-Governor, endorsing the remarks of the Inspector-General of Civil Hospitals, considers that it is necessary to provide for selected men of the hospital assistant class a better career than that now open to them. His honour refers in particular to the case of Hospital Assistant Mathra Das, whose surgical record is the second in the whole province. "It savours terribly of red tape," says the review, "that such an officer should not be able to rise in Government service to a salary exceeding Rs.70."

Lunatic Asylums in Burma.

Colonel W. G. King, C.I.E., I.M.S., just before his recent retirement published the annual note on the Burma lunatic asylums at Rangoon and Minbu. There is a marked increase of recent years in the number of lunatics in Burma, an increase of 70 per cent. in the past ten years. Lower Burma furnishes lunatics to the extent of 8·2 per 100,000, and Upper Burma 3·3—a statement which well illustrates the connexion between the development of a province and the resulting pressure on the mental powers of its inhabitants. The question of accommodation for lunatics is a pressing one; even the new temporary asylum at Minbu is full up and the Rangoon Asylum is constantly overcrowded. At Minbu the newly instituted small infiltration gallery for distributing good water has been a success, and Dr. H. E. Wells, the superintendent, considers it should serve as a model for the water-supply of the town of Minbu. The death-rate at Minbu was 32 per 1000, including three fatal cases of cholera, probably fly-borne. At Rangoon the death-rate was 93 per 1000. We learn that forcible nasal feeding was practised in 31 cases, in one case for 64 days, and in the others for an average of 16 days, with good results. It is very interesting to note that there were two fatal cases of general paralysis of the insane—a disease usually considered very rare in Indian asylums. Captain W. S. J. Shaw, I.M.S., the superintendent of the Rangoon Asylum, recently had two such cases also, so perhaps the disease is not quite so uncommon as supposed.

Malarial Fevers in Eastern Bengal and Assam.

It is regrettable, in view of the extensive prevalence of malaria which continues in Eastern Bengal and Assam, to find that a deep-rooted prejudice against the use of quinine still characterises that province. Except in the Faridpur district, which sold a considerable number of tablets, and where these appear to be generally preferred to quinine powders, and in Rangpur, where they seem to be gradually acquiring an increasing popularity, tablets have not apparently found any great favour with the people. The percentage of quinine distributed to the population of Eastern Bengal during 1909 is, however, nearly double that distributed in Assam, and a possible explanation of this fact is the extensive free distribution on tea-gardens by managers in the latter region. There can be no doubt, however, that the comparatively exiguous amount of quinine sold over the entire province does represent a very marked objection to the medicine, and that the prejudice indicated can only be removed by slow degrees, as its value as a prophylactic and a remedy for malarial fever becomes better known to the people. It must, therefore, be a great satisfaction that the memorandum issued not long ago by Dr. A. Bentley on quinine distribution has been receiving careful attention in Eastern Bengal and Assam, and that it has already been used as the basis of recommendations for radical changes, not only in the method of distribution, but also in the form of quinine chosen for use in the provinces. Briefly reviewed, the scheme which it is proposed to adopt consists in the abolition of the pice-packet system and the substitution for it of a system in which the minimum amount of quinine to be sold to a consumer is sufficient for the treatment of an attack of fever. To meet this requirement it is proposed to issue "treatments," consisting of 20 four-grain tablets of hydrochloride of quinine, this salt being adopted because of its higher quinine content

and much greater solubility as compared with the sulphate. Each "treatment" will be issued in a glass phial enclosed in a wrapper containing directions for use of the contents, and simple instructions for the personal prophylaxis of malaria. Ten treatments constitute a "parcel," the minimum quantity to be sold to retailers, and this will be so packed as to be capable of transmission through the post without risk of breakage. It is proposed to sell treatments at 3½ annas each, retailers getting a profit of 9 annas on the sale of a parcel. This profit, which amounts to about 33 per cent., has purposely been fixed at a high rate in order to encourage the sale of quinine, and with the same object it is proposed to make the retail agency as wide as possible and to resort to the use of advertisements, leaflets, and posters. A separate scheme is also under preparation for special "treatments" for children, consisting of tannate of quinine, or some other comparatively tasteless salt mixed with an attractive flavouring agent; while in order that the very poor may not be excluded from the benefits of the "treatment" system, it is further proposed to make provision for the free distribution of quinine by special agency in areas severely affected by malaria.

Malaria in Burma.

A resolution issued by the Government of Burma refers to the malaria conference at Simla in October last year and mentions that the conference particularly recognised the importance of conducting systematic investigations into the distribution of malaria, its epidemiology and endemiology, and the value of quinine and other remedies. To direct and coördinate such investigations the Government of India has announced its intention of appointing a central scientific committee and it has invited the Government of Burma to establish a provincial committee to work in consultation with the central committee and to carry out investigations in this province. The Lieutenant-Governor of Burma has accordingly appointed a provincial malaria committee which will be constituted as follows:—Inspector-General of Civil Hopitals, Burma, the Commissioner of Pegu Division, the Sanitary Commissioner of Burma, the Sanitary Engineer of Burma, the senior civil surgeon, Rangoon, Dr. A. R. J. Douglas, Dr. Harry Findlay, Mg. Atoon Myat, Dr. T. F. Pedley, Mg. Ba Shin, Mr. B. J. B. Stephens, the Hon. Mg. Be Too, Captain A. Whitmore, I.M.S., and the Deputy Sanitary Commissioner, Burma (secretary). The committee will hold its meetings in Rangoon and is empowered to obtain any information which it may require from officers of Government, who will, his honour is confident, coöperate with it by every means in their power. It is specially important that the committee should be fully informed about the local conditions and idiosyncrasies of the people in different parts of the province.

The Birth-rate in the Central Provinces.

The Central Provinces and Berar boast the highest provincial birth-rate in India. It was 51·63 per 1000 last year, and though this was lower than it had been for five years, it was still over 11 per 1000 more than the rate for Eastern Bengal and Assam, which comes second on the list for the whole country. Side by side with this high birth-rate, it is sad to notice, however, the direct effect it has on the mortality returns for the province. This will be understood when it is mentioned that one out of every two deaths which takes place is that of a child under the age of five years. The infantile mortality during 1909 was 221·94, and enormous though this appears, it still compares favourably with the rate for 1908. Reformation in domestic hygiene is of course what is required for lowering the infantile mortality, and this is a much more complex problem than that with which the Finance Ministers have been faced in finding grants for sanitation. No more progress has been made towards the solution of the problem in the Central Provinces and Berar than elsewhere in India. Efforts that have been made to train midwives have met with scanty success, but they are not to be abandoned, as the Chief Commissioner is optimistic and believes that some good may be done at last. Captain H. N. Stokes, I.M.S., the Sanitary Commissioner, advocates the employment of one really good woman at each headquarter town, whose methods would become known and from whom, by a system of apprentices, the want of experienced midwives may become satisfied.

Nov. 12th.

Obituary.

THOMAS NADAULD BRUSHFIELD, M.D. ST. AND., M.R.C.S. ENG., F.S.A.

Dr. Brushfield died on Nov. 28th at his residence, The Cliff, Budleigh Salterton, Devon, in his 82nd year. The deceased, who received his medical education at the London Hospital, qualified M.R.C.S. in 1850, and 12 years later graduated M.D. of St. Andrews. After holding a resident appointment at the London Hospital, Dr. Brushfield was appointed medical superintendent at the Chester County Asylum. He held this post for some years, and was then made medical superintendent of the Surrey County Asylum at Brookwood, retiring on a pension in 1882, mainly owing to the effects of an injury received from a patient. Afterwards he settled at Budleigh Salterton, where he soon became very popular. He took great interest in archæology, and was a frequent contributor to "Devon and Cornwall Notes," and his examination of old documents brought out many facts concerning the life of Sir Walter Raleigh (who, as Dr. Brushfield showed, really spelt his name Ralegh). Dr. Brushfield was much interested in all matters relating to Sir Walter Raleigh, and when the Canadian and American journalists visited Devonshire last year he gave them an interesting address on the subject, showing them over Hayes Barton, the interesting old house where Raleigh was born.

Dr. Brushfield also contributed to the English Dictionary published by the University of Oxford, to which he furnished no less than 70,000 references to local antiquarian and literary subjects. Among the more important of his works are a history of All Saints Church, East Budleigh, and the "Life and Writings of Sir Walter Ralegh." He was a member of the Medico-Psychological Association and of the British Archæological Association; honorary member of the Chester Medical Society, of the Torquay Natural History Society, of the Teign Naturalists' Field Club, and of the Chester Archæological Society; local secretary and Fellow of the Society of Antiquaries, and member and past president of the Devonshire Association (1893). The pages of the "Western Antiquary" and the volumes of the Transactions of the Devonshire Association for the past 28 years owe much to his pen. Dr. Brushfield possessed one of the most valuable and extensive libraries in the West of England. He will be much missed in Budleigh Salterton and the district.

EDWARD HENRY BRIEN, M.D. DUB.

REGRET is expressed in Rock Ferry and district at the death of Dr. Edward H. Brien, which occurred with painful suddenness on Nov. 24th. Dr. Brien commenced practice in Rock Ferry 22 years ago in succession to the late Dr. Nixon, and was only 52 years of age at the time of his death.

Dr. Brien's father, a fleet-surgeon in the navy, who served in the Crimean war, died whilst his son was yet a boy, and an uncle, Archdeacon Brien, acted in consequence in place of a parent. From school Edward Brien went to Trinity College, Dublin, and there graduated as B.A., and later took his M.D. degree. He was only 30 years of age when he settled in Rock Ferry, but from the first he was a general favourite with all classes. He became a keen politician and an energetic public man. He served for many years on the Birkenhead town council, acting on many committees, and he gave excellent service as chairman of the electricity committee, for which position he was well fitted by his practical knowledge of mechanics. Later he was elected to the position of chairman of the watch committee, and he had just been reappointed to this post at the time of his death. He was a keen motorist and understood his car better than any other medical man in the town. He was, in fact, the pioneer of motoring in the district, his steam-car being the first of its kind and also the first doctor's motor in Birkenhead. He was president of the Birkenhead Medical Society in 1904, and was a constant and active member up to the end. He was also chairman of the Conservative party in his district, and in all branches of his work he was universally popular.

He apparently enjoyed robust health until a short time ago, when he occasionally complained of pains in the neck and left shoulder, which he attributed to rheumatism, and it was only on Nov. 16th, whilst doing his morning round

that a severe attack caused him to realise that he was the victim of angina pectoris, and attention being drawn to the urine he was found also to have glycosuria. On the morning of his death he expressed himself as well and fit for work, and indeed the fatal seizure was probably induced by his running upstairs for his visiting list, for he dropped in the room and died almost immediately with the book in his hand.

The funeral was a very representative one, the Mayor, many members of the town council, corporation officials, fire brigade, police, and a large portion of his professional brethren turning out to do the last honour to one who had been adviser, colleague, and friend to so many, who had served his community so well, and stood so high in the esteem of the poor. Much sympathy is felt for his wife and two sons, the elder of whom is studying for his father's profession.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. W. Forest, professor of orthopædic surgery in Pennsylvania University, Philadelphia.—Dr. Hans Goldschmidt of Berlin, an eminent urologist, who devised a valuable form of urethroscope. He was 58 years of age.

Medical News.

UNIVERSITY OF OXFORD.—In the recent examination for the Diploma in Public Health the following were approved:—

Part I.—H. S. Burnell-Jones, D. G. Evans, F. R. Seymour, and C. B. Roscrow.
Parts I. and II.—P. N. Cave, T. Chetwood, R. A. Clapham, W. P. MacArthur, A. C. Parsons, O. P. Turner, and G. C. Welch.
Part II.—G. Finch and Rachel E. W. Mackenzie.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The following candidates have passed the primary part of the Fellowship Examination:—

Mr. J. D. Cherry, Miss Z. A. De Cruz, L.R.C.P. & S. Edin., Mr. T. O. Graham, M.B., B.Ch. Dub., Mr. J. R. May, Mr. G. E. Pepper, and Mr. S. R. Rao, L.R.C.P. & S. Edin.

The following candidates have passed the final part of the examinations and have been admitted Fellows of the College:—

Miss I. M. Clarke, L.R.C.P. & S. Irel.; Mr. H. English, M.B., B.Ch. Dub.; Mr. K. T. Nath, L.R.C.P. & S. Edin.; Mr. G. F. Shepherd, L.R.C.P. & S. Irel.; and Miss C. F. Williamson, L.R.C.P. & S. Irel.

UNIVERSITY OF BRISTOL: THE LATE DR. LONG FOX.—The seventh annual "Long Fox" lecture will be delivered in the medical library on Dec. 15th at 4.15 P.M. by Professor J. Michell Clarke. The subject will be "Cerebro-spinal Syphilis."

ROYAL INSTITUTION.—The following are the lecture arrangements at the Royal Institution before Easter:—Professor Silvanus P. Thompson: A Christmas Course of Six Illustrated Lectures on Sound, Musical and Non-musical, a Course of Experimental Acoustics, adapted to a Juvenile Auditory—(1) production of sound; (2) transmission of sound; (3) reception of sound; (4) combination of sounds; (5) registration of sounds; and (6) reproduction of sound. Dr. F. W. Mott, Fullerian professor of physiology, R.I.: Six Lectures on Heredity. Dr. A. E. H. Tutton: Three Lectures on Crystalline Structure—mineral, chemical, and liquid. Dr. M. Aurel Stein: Three Lectures on Explorations of Desert Sites in Central Asia. The Astronomer Royal, Mr. F. W. Dyson: Three Lectures on Recent Progress in Astronomy. Dr. P. Chalmers Mitchell: Three Lectures on Problems of Animals in Captivity. Mr. A. C. Benson: Two Lectures on Ruskin. Dr. Arthur Keith: Two Lectures on Giants and Pygmies. Professor W. A. Bone: Two Lectures on Surface Combustion and its Industrial Applications. Professor Sir J. J. Thomson, professor of natural philosophy, R.I.: Six Lectures on Radiant Energy and Matter. The Friday evening meetings will commence on Jan. 20th, when Professor Sir James Dewar will deliver a Discourse on Chemical Change at Low Temperatures. Succeeding discourses will probably be given by Professor W. H. Bragg, Mr. A. E. Shipley, Professor H. E. Armstrong, Professor Jean Perrin, Professor Karl Pearson, Mr. J. H. Balfour-Browne, Sir David Gill, Professor H. S. Hele-Shaw, Professor Sir J. J. Thomson, and other gentlemen.

A GLOUCESTERSHIRE CENTENARIAN.—Mr. T. M. Enstone of Sandhurst, Gloucestershire, died on Nov. 24th. There is an official record of the fact that he was christened on Oct. 9th, 1808.

Messrs. Down Bros., Limited, of St. Thomas's-street, London, have been awarded the Grand Prix (highest award) for surgical instruments and aseptic hospital furniture at the Buenos Aires Exhibition, 1910, as well as the Grand Prix (highest award) at the Brussels Exhibition, 1910.

THE LATE DR. ARTHUR FOXWELL.—At the Queen's Hospital, Birmingham, the Foxwell Memorial Tablet was unveiled by Professor Jordan Lloyd on Nov. 22nd, in the presence of a representative company of the subscribers, hospital staff, committee, residents, and nurses. Professor J. T. J. Morrison, chairman of the medical committee, presided, and Mrs. Foxwell and Miss Foxwell were amongst those present. The tablet, which is of bronze, is in the form of a memorial bust, and is the work of Mr. Courtenay Pollock. It is inscribed: "Arthur Foxwell, physician to this hospital, 1889–1909. Erected by his colleagues and friends." Professor Morrison said the proceedings that afternoon were the outcome of a movement begun some months ago by the medical committee. They felt strongly and unanimously that the hospital ought to contain some conspicuous evidence of the regard and affection in which they held their late friend and colleague. It was not forgotten that the open-air ward in the medical building—the first of its kind, as far as he knew, in England—must always be associated with him. The idea was his sole conception and was carried into effect under his thoughtful supervision. But they wanted something more obviously personal and distinctive upon which his name might be inscribed, and which would challenge the notice and inquiry of the observer. After due consideration it was decided—and he felt sure the subscribers would endorse the decision—that the memorial should take the two-fold form of a mural tablet and a medical prize. The tablet was very appropriately the work of Mr. Courtenay Pollock, a stepson of Dr. Foxwell, and an artist of considerable talent. The endowment fund of the Foxwell Memorial Essay would provide a prize in clinical medicine, to be competed for annually by qualified residents of the Queen's Hospital, General Hospital, and the Children's Hospital. By these means they wished, and they expected, to preserve the memory of their friend in the minds of his fellow workers, and to continue the influence of his personality upon those who might follow them in the future. Professor Jordan Lloyd, as the senior member of the Queen's Hospital staff, then unveiled the tablet. He referred with emotion to his long friendship with Dr. Foxwell, and said he had learned to hold him in the highest regard as a man, to esteem him as a scholar, and to revere him as a devotee of the profession he had chosen. Invited to speak by the chairman, Dr. O. J. Kauffmann, the senior physician, said that it might interest those present to learn what had been done with the money collected for the Foxwell Memorial. The sum subscribed was close upon £200. £50 had been paid for the memorial tablet, and the rest had been invested in a debenture security, which would bring in about £6 per year. This small amount it was proposed to present annually for the best prize essay, which should be open to competition by the residents of the Queen's, the General, and the Children's hospitals. The subject of the essay would be fixed by the medical committee of the Queen's Hospital, which had reserved to itself the right to alter the regulations affecting the prize if it should appear that a change would be advantageous. They had thought it well to depart from the usual fashion of giving a prize to students because they knew that the plan they had devised would have been approved by Dr. Foxwell, whose sympathy was ever with young members of the profession who endeavoured to further the march of science; and they trusted that those who would compete for the prize would use personal observations on disease as the mainstay of their essays. Mr. Keep, chairman of the hospital committee, in moving a vote of thanks to the chairman and to Professor Jordan Lloyd, said the memorial would serve as a link between these days and the days to come. It would remind the men and women

who were in the hospital of a distinguished man who had preceded them, and whose memory his friends delighted to honour. The motion was seconded by Alderman Clayton, and was duly carried and acknowledged.

METROPOLITAN WATER BOARD: APPOINTMENT OF DISTRICT MEDICAL OFFICERS.—The Works and Stores Committee of the Metropolitan Water Board reported, at the meeting of the Board on Friday, Dec. 2nd, vacancies caused by the resignation of Dr. Percy Pope and the death of Dr. C. Adams, district medical officers for the Barrow Hill Division of the Western District and the Buckhurst Hill Division of the Eastern District respectively. To fill these vacancies it was resolved to appoint Mr. Beresford Kingsford, M.D., D.P.H., in the Western District, and Mr. P. W. Moore, M.B., M.R.C.S., L.R.C.P., in the Eastern District. The committee had also received notice of the resignation of Dr. T. E. B. Meyler, of the Battersea, Brixton, and Wandsworth Division of the Southern District, and a report as to filling the vacancy was promised at a later date. Dr. W. Anderson, who was appointed to act jointly with his partner, Dr. R. Cobb, in the East of Lee Division of the Eastern District, has removed from the neighbourhood, but the committee considered it unnecessary to fill the vacancy thus caused, and his name was removed from the Board's list of district medical officers.

A SPECIAL meeting of the medical men resident in the electoral division of Rossendale was held on Nov. 30th at Rawtenstall. There was a good attendance. Dr. J. Brown of Bacup was called to the chair, and Dr. E. W. Falconer of Stacksteads was asked to act as secretary. The Chairman stated that the meeting was convened to discuss the questions of State sickness and invalidity insurance, and of coroners' law and death certification, as affecting the medical profession. Several members who had had experience in other parts of the country of club and contract practice spoke of its being most unsatisfactory. The following resolution was then proposed by Dr. J. Broomhead of Haslingden, and seconded by Dr. A. A. Edward of Rawtenstall:—

That the principle of limited payment for unlimited medical services has to a large extent proved most unsatisfactory to the patients and to the doctors. This meeting therefore is strongly opposed to this principle, and urges on the Government in any future legislation in the proposed State Sickness and Invalidity Insurance Bill that there shall be freedom of choice of doctor by the patient, and that the principle of payment shall be for medical services rendered.

This was carried unanimously. Copies of this resolution were ordered to be sent to the Right Honourable Lewis Harcourt, the Right Honourable Lloyd George, and the Central Council of the British Medical Association. Mr. McIlraith of Rawtenstall then proposed and Dr. J. A. Harrison of Haslingden seconded:—

That the proposed Coroners' Law and Death Certification Bill should be amended as follows: "That the body be viewed within three days of death having taken place, and that there be a minimum fee and mileage for the certificate."

This was also carried unanimously. The resolution was ordered to be sent to the Right Honourable Lewis Harcourt, Sir W. Collins, and the Central Council of the British Medical Association.

PRESENTATION TO MR. CHARLES J. BOND.—A representative assembly of members of the profession was present on Dec. 1st at the Grand Hotel, Leicester, when a presentation of a silver tea and coffee service was made to Mr. C. J. Bond. The proceedings commenced with an informal dinner to which nearly 90 gentlemen accepted invitations, though owing to the exceedingly inclement condition of the weather several were prevented from attending. The chair was occupied by Mr. C. F. Bryan, the oldest practising member of the profession in the town. At the close of the dinner the chairman gave the toast of "The King," and then briefly proposed Mr. Bond's health, reserving further remarks for the subsequent presentation ceremony. Mr. Bond made a short reply. The party then adjourned and a reception was held in an adjoining room, which was attended by a large number of the wives and daughters of the subscribers. The company was received by Mr. and Mrs. Bryan and by Mr., Mrs., and Miss Bond. The Mayoress of Leicester, Miss Vincent, was present. Mr. Bryan made the presentation. In felicitous terms he spoke of Mr. Bond's career at University College, where he carried off many prizes and held the appointments of house surgeon and assistant demonstrator of anatomy. After being house surgeon at Bedford Infirmary and Leicester Infirmary he joined the staff of the latter institution in 1886 and was now its senior surgeon. The chairman went on to speak of the high position which Mr. Bond held among the medical profession in Leicester and Leicestershire. He counted almost every medical practitioner as a personal friend, and many of them, their wives and families, as patients. Almost every medical practitioner in the district had contributed towards the presentation, and Mr. Bryan stated that it gave him the sincerest gratification to present the articles of plate to Mr. Bond. These consisted of a massive silver tea and coffee service and salver, on the last of which was inscribed: "To C. J. Bond, F.R.C.S., from his medical friends in Leicester and neighbourhood as a token of affection and esteem on his retirement from practice, 1910." Mr. Bond, in acknowledgment, wished all to understand that he felt very deeply the kindness of every one of the subscribers.

THE LONDON COUNTY COUNCIL AND THE TREATMENT OF SCHOOL CHILDREN.—The Education Committee of the London County Council are recommending that the agreements entered into by the Council with six metropolitan hospitals for the medical treatment of children in the Council's schools should be renewed for one year.

BOOKS, ETC., RECEIVED.

BIDDLE AND SHIPPAM, Guildford.

Why is this so? A Consensus of Qualified Opinion upon a Cause of Pelvic Disease. By Henry Holden. Price 2s., post free.

CASSELL AND CO., LIMITED, London, New York, Toronto, and Melbourne. (For LETTS' DIARIES CO., LIMITED.)

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Letts's Medical Diary for the Year 1911. For 54 or 108 patients. Prices range from 2s. 6d. to 10s. according to size and binding.
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CHURCHILL, J. AND A., London.

Manual of Clinical Pathology. For the General Practitioner. By Richard Weiss, M.A., Ph.D., F.C.S., in collaboration with George Herschell, M.D. Lond., and Andrew Charles, F.R.C.S. Dublin. Price 2s. net.

COLLINGRIDGE, W. H. AND L., London.

Garden Foes. By T. W. Sanders, F.L.S., F.R.H.S. Price 2s. 6d. net.
Carnations, Picotees, and Pinks. By T. W. Sanders, F.L.S. Price 2s. 6d. net.

FUNK AND WAGNALLS COMPANY, New York and London.

The Marvels Beyond Science. (L'Occultisme Hier et Aujourd'hui; Le Merveilleux Prescientifique). Being a Record of Progress Made in the Reduction of Occult Phenomena to a Scientific Basis. By Joseph Grasset, M.D. With a Preface by Emile Faguet, of the French Academy. Authorised English Translation of the Second Revised and Enlarged French Edition, by René Jacques Tubeuf, Fellow of the University of Paris. Price 7s. 6d. net.

GLAISHER, HENRY J., London.

The Non-surgical Treatment of Duodenal Ulcer. By George Herschell, M.D. Lond. Price 1s. net.

HAZELL, WATSON, AND VINEY, LIMITED, London.

Smith's Physicians' and Surgeons' Visiting List, Diary, Almanack and Book of Engagements for 1911. Sixty-fifth year. Published in four styles of binding and six different sizes. Prices from 2s. 6d. to 6s. 6d. each.

HEINEMANN, WILLIAM, London.

The Encyclopædia of Sport and Games. Edited by the Earl of Suffolk and Berkshire. Volume I. A—Cricket. Cash price in Great Britain and Ireland, cloth, 10s. 6d. net; abroad, 12s. 6d. net.

HOULSTON AND SONS, 7, Paternoster Buildings, London. (MENZIES, JOHN, AND CO., Edinburgh and Glasgow.)

The Ambulance Vade-Mecum. "First Aid" to Injured and Sick. By J. F. Sutherland, M.D. Thirty-sixth edition—36,000. Revised and enlarged, 1909. Price 3d.

KEGAN PAUL, TRENCH, TRÜBNER, AND CO., LIMITED, London.

The Views of "Vanoc": An Englishman's Outlook. By Arnold White. Price 5s. net.

LAURIE, T. WERNER, London.

Logic for the Million. Edited by T. Sharper Knowlson. Price 6s. net.

Ghostly Phenomena. By Elliot O'Donnell. Price 3s. 6d. net.

LIFE ASSURANCE MEDICAL OFFICERS' ASSOCIATION, London.

Transactions of the Life Assurance Medical Officers' Association, London. Comprising the Report of the Proceedings for 1908 and 1909. Price not stated.

RUDALL, CARTE, AND CO., LIMITED, London.

The Professional Pocket-book or Daily and Hourly Engagement Diary for 1911. Specially adapted for Professional Engagements. In three parts. January-April, May-August, September-December. Price not stated.

WRIGHT, JOHN, AND SONS, LIMITED, Bristol. SIMPKIN, MARSHALL, HAMILTON, KENT, AND CO., LIMITED, London.

Wrights' Improved Physicians' and Surgeons' and Consultants' Visiting List. Compiled by Robert Simpson, L.R.C.P., L.R.C.S. Form A. 1911. Eighteenth edition. Price from 5s. to 7s. each, according to size.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BOND, HOPETOUN E., M.D., C.M., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., has been appointed House Surgeon to the Teignmouth Hospital.

BOOTH-JONES, C., has been appointed Second Assistant Medical Officer to the Warwick County Lunatic Asylum.

BROWN, HORACE G., M.R.C.S., L.R.C.P. Lond., has been appointed Medical Officer to the Workhouse, District Medical Officer, and Public Vaccinator to the Bedwellty Board of Guardians *pro tem.*

BUZZARD, E. FARQUHAR, M.D. Oxon., F.R.C.P. Lond., has been appointed Physician to Out-patients at St. Thomas's Hospital.

CHOYCE, CHARLES COLEY, M.D. Edin., B.Sc., F.R.C.S. Eng., has been appointed Surgeon to Out-patients at the Great Northern Central Hospital.

DARLING, H., M.B., B.S., has been appointed House Surgeon at University College Hospital.

FISHER, F. R., F.R.C.S. Eng., has been appointed Honorary Consulting Surgeon to the Surgical Aid Society.

HUGHES, DAVID ARTHUR, L.R.C.P. Lond., M.R.C.S., D.P.H. Lond., has been appointed Medical Officer of Health of the County of Carmarthen.

JONES, EDWARD T., M.R.C.S. Eng., has been appointed Medical Officer and Public Vaccinator of the Petersfield Union, No. 1 East Meon District.

LEECH, H. B., M.D. Dub., has been appointed Senior Assistant Medical Officer to the Warwick County Lunatic Asylum.

O'DRISCOLL, P. L., M.B., B.S. R.U.I., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Timoleague District of the county of Cork.

OLLERENSHAW, ROBERT, M.D., Ch.B. Vict., F.R.C.S. Eng., L.R.C.P. Lond., has been appointed an Honorary Assistant Surgeon to the Salford Royal Hospital.

ORR, JAMES, L.R.C.P. Edin., D.P.H., has been appointed Medical Officer of Health for the County Borough of Barrow-in-Furness.

SIMSON, H. J. F., M.B., M.S. Edin., F.R.C.S. Edin., has been appointed Assistant Physician for Diseases of Women at the West London Hospital.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BARNSTAPLE, NORTH DEVON INFIRMARY.—House Surgeon. Salary £100 per annum, with board, residence, and washing.

BEDFORD COUNTY HOSPITAL.—House Physician. Salary £80 per annum, with apartments, board, and laundry.

BERMONDSEY INFIRMARY, Lower-road, Rotherhithe, S.E.—Second Assistant Medical Officer. Salary £120 per annum, with rations, washing, apartments, &c.

BOURNEMOUTH, ROYAL VICTORIA HOSPITAL.—House Surgeon. Salary £100 per annum, with board, rooms, and laundry.

BRADFORD UNION, EASTBY SANATORIUM, near Skipton.—Assistant Resident Medical Officer, unmarried. Salary £130 per annum, with rations, apartments, and laundry.

BRIDGWATER HOSPITAL.—House Surgeon for six months, unmarried. Salary at rate of £100 per annum, with board, lodging, and washing.

BRIGHTON, SUSSEX COUNTY HOSPITAL.—Assistant House Surgeon, unmarried. Salary £60 per annum, with apartments, board, and laundry.

CAIRO, EGYPT.—Medical Tutor at School of Medicine and Registrar to Kasr-El-Ainy Hospital. Salary £E.600 a year.

CANTERBURY, KENT AND CANTERBURY HOSPITAL.—House Physician, unmarried. Salary £70 per annum, with board, lodging, and washing.

CARDIFF INFIRMARY (GENERAL HOSPITAL).—Two House Surgeons for six months. Salary £30, with board, residence, and laundry.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—Clinical Assistant.

DERBYSHIRE ROYAL INFIRMARY.—House Physician and Second House Surgeon for 12 months. Salary in each case £100 per annum, with apartments, board, &c. Also Assistant House Surgeon for six months. Salary at rate of £60 per annum, with apartments, board, &c.

GLASGOW PARISH COUNCIL, STOBHILL GENERAL HOSPITAL, Springburn.—Two Junior Resident Assistants (male and female). Salary £120 per annum, with board and apartments.

HASTINGS, ST. LEONARDS, AND EAST SUSSEX HOSPITAL.—Senior House Surgeon. Salary £100 per annum, with residence, board, and washing.

INDIAN MEDICAL SERVICE, India Office, London.—Fourteen Commissions in His Majesty's Indian Medical Service.

LEEDS GENERAL INFIRMARY.—Ophthalmic House Surgeon for six months. Salary at rate of £50 per annum, with board, residence, and washing.

LEICESTER INFIRMARY.—Second House Surgeon for six months. Salary at rate of £100 per annum, with board, apartments, and washing. Also Honorary Pathologist.

LINCOLN GENERAL DISPENSARY.—Resident Junior Medical Officer, unmarried. Salary £175 per annum, with apartments, &c.

LIVERPOOL, HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Mount Pleasant.—Assistant Medical Officer and Pathologist. Salary £200 per annum.

MANCHESTER DENTAL HOSPITAL.—Honorary Anæsthetist.

MIDDLESEX HOSPITAL, W.—Second Assistant to Bacteriological and Clinical Laboratories.

NATIONAL DENTAL HOSPITAL AND COLLEGE, Great Portland-street, W.—Anæsthetist.

NORWICH, NORFOLK AND NORWICH HOSPITAL.—Assistant House Surgeon for six months. Salary £20, with board, lodging, and washing.

PARK HOSPITAL FOR CHILDREN, Hither Green, S.E.—Senior Assistant Medical Officer. Salary £250 per annum. Also Assistant Medical Officer. Salary £150 per annum. Both with board, lodging, and washing.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Surgeon for six months. Salary at rate of £80 per annum, with board, residence, and washing.

ROTHERHAM HOSPITAL.—Senior House Surgeon. Salary £110 per annum, with board, lodging, and washing.

ROYAL HOSPITAL FOR DISEASES OF THE CHEST, City-road, E.C.—Assistant Physician.

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—Tutor in Public Health.

ST. LUKE'S HOSPITAL FOR MENTAL DISEASES, Old-street, London, E.C.—Second Assistant Medical Officer, unmarried. Salary £130 per annum, with board, apartments, and washing.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, London, E.C.—House Surgeon. Salary £80 per annum, with board, lodging, and washing.

ST. THOMAS'S HOSPITAL.—Dental Surgeon.

SHEFFIELD ROYAL HOSPITAL.—Assistant House Physician, unmarried. Salary £50 per annum, with board, lodging, and washing.

SOUTHAMPTON, FREE EYE HOSPITAL.—House Surgeon. Salary £100 per annum, with board and residence.

SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—House Physician. Salary £100 per annum, with rooms, board, and washing.

SOUTH UIST.—Medical Officer. Salary £100, with house.

STAFFORD, STAFFORDSHIRE GENERAL INFIRMARY.—Assistant House Surgeon. Salary £82 per annum, with board, residence, and laundry.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—House Physician for six months. Salary £40, with board, lodging, and laundry.

WANDSWORTH UNION INFIRMARY, St. John's-hill, near Clapham Junction.—Junior Assistant Medical Officer, unmarried. Salary at rate of £120 per annum, with board, lodging, and washing.

WEST LONDON HOSPITAL, Hammersmith-road, W.—Assistant Physician. Also Honorary Medical Registrar.

WESTON-SUPER-MARE HOSPITAL.—House Surgeon, unmarried. Salary £100 per annum, with board and residence.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Act at Athlone, in the county of West Meath; at Whitstable, in the county of Kent; and at Brigg, in the county of Lincoln.

Births, Marriages, and Deaths.

BIRTHS.

BUZZARD.—On Dec. 1st, at Wimpole-street, W., the wife of E. Farquhar Buzzard, M.D. Oxon., F.R.C.P., of a daughter.

DRAKE.—On Nov. 29th, the wife of A. W. Courtney Drake, M.B., B.C., of a son.

GUTCH.—On Dec. 1st, at Fonnereau-road, Ipswich, the wife of John Gutch, M.D. Cantab., of a son.

SODEN.—On Nov. 28th, at Mapesbury-road, Brondesbury, the wife of Dr. Wilfred Soden, prematurely, of a son (stillborn).

MARRIAGES.

BUSHNELL—EWING.—On Nov. 26th, at St. George's, Hanover-square, Percy Charles Bushnell, M.R.C.S., L.R.C.P., to Mary Jessie Ramsay, daughter of the late William Ewing, of Ardmohr, Kirn, N.B.

DEATHS.

BOND.—On Nov. 30th, at Suffolk Lodge, Maida Vale, Joseph Henry Bond, L.R.C.P.I., aged 54 years.

DE JERSEY.—On Dec. 2nd, at Ascot, Walter Brock de Jersey, M.B. Camb., of Netherton, Guildford, aged 47 years.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

RATS.

RATS are rapidly becoming creatures of first importance in sociology, and it is interesting to refer to chronicles and see how our fathers and grandfathers viewed the rat in its relation to mankind and civilisation. An article was published in the *Quarterly Review* in 1857 by Dr. Andrew Wynter, who wrote many essays on interesting subjects outside medicine and was also a medical journalist and editor of the *British Medical Journal* from 1856 to 1860. After quoting Grainger's poetic invocation, "Now, Muse, let's sing of rats," the "whisker'd vermin race," Dr. Wynter discusses the origin of the land rats in England, the old English black rat, and the Norwegian, or brown rat. The genuine ship rat, he states, is a more delicate animal than the brown rat, and the water rat he finds to be an entirely different species from the ship rat. Dr. Wynter's story of the extinction of rats from the London sewers is gruesome. Not many years since, he says, they existed in millions in the drains and sewers of the metropolis, but the method of flushing the sewers which had been adopted about the time of writing this article proved, he considered, exceedingly fatal to them. "When the sluices are opened," he says, "go they must with the rush of waters, and they may be seen shot out by hundreds from the mouths of the culverts in the Thames." The fact that rats in that hyper-sporting time were worth 3*s.* a dozen for sporting purposes proved, he thought, another most certain means of their destruction, for it ensured their ceaseless pursuit by man. Talking of London, he writes that the underground city of sewers became one vast hunting-ground, in which men regularly gained a livelihood by capturing them. These vermin congregated thickest in the neighbourhood of slaughter-houses or, in other words, where food was most plentiful. A remarkable tale is related of a great killing of rats by the proprietor of one of the Montfaucon slaughter-houses, who, aided by his workmen, killed 16,050 rats in a month, and 2650 in a single night on his own premises by means of blows from sticks held in one hand and torches in the other. Dr. Wynter gets off on his audience some well-known though little authenticated anecdotes of the sagacity of rats. He describes them as leading their blind companions to food, as fishing for oil with their tails, and as transporting eggs by the process of one rat lying on his back clasping the egg while his comrade drags him away by the tail. He speaks of the proprietors of the bonded wheat warehouses on the banks of the Thames who are forced to take the utmost precautions against the entrance of myriads of rats from the sewers and waterside premises, and describes wheat stacks and ricks in the country which, although seeming fair on the outside, are being really "little better than a huge rat-pie." Terriers and ferrets in their relation to rats receive a few pages of attention, and a tale is told of the driver of a London omnibus who made a pet of a piebald rat who acted as guardian of the driver's dinner on the boot of the omnibus and at night went home in his master's pocket, and on cold nights crept in his master's bed for warmth and slumber. At the word of command, "Come along, Ikey," he would jump into the ample great-coat pocket. The following paragraph must conclude our extracts from Dr. Wynter's interesting article:—

> "The rat, as we have said, has many enemies; the weazel, the pole-cat, the otter, the dog, the cat, and the snake hunt him remorselessly all over the world. Man, however, is his most relentless and destructive enemy. In some places he is killed for food, as in China, where dried split rats are sold as a dainty. The *chiffonniers* of Paris feed on them without reluctance. Nor is rat-pie altogether obsolete in our own country. The gipsies continue to eat such as are caught in stacks and barns, and a distinguished surgeon of our time frequently had them served up at his table. They feed chiefly upon grain; and it is merely the repulsive idea which attaches to this animal under every form that causes it to be rejected by the same man who esteems the lobster, the crab, and the shrimp a delicacy, although he knows that they are the scavengers of the sea. They were not always so nice in the navy. An old captain in Her Majesty's service informs us that on one occasion, when returning from India, the vessel was infested with rats, which made great ravages among the biscuit. Jack, to compensate for his lost provisions, had all the spoilers he could killed, put into pies, and considered them an extraordinary delicacy."

COMPLETE TRAUMATIC AVULSION OF THE HEART.

THE following case is worth recording. A boy, aged 6, was brought in dead to St. Mary's Hospital on Oct. 28th, death having been produced by severe injuries inflicted by a motor omnibus. The external injuries were strikingly slight, consisting merely of bruises and abrasions of both groins, the perineum, anterior part of left iliac crest, left clavicle, front of left and back of right elbow; the prepuce was also lacerated; a little blood was present on the face from the nose. On opening the body the following injuries were discovered: A depressed fracture of the symphysis, pubis, and left innominate bone; lacerated wounds of the anterior part of the liver, spleen, and small intestine. All the ribs on the left side, except the eleventh and twelfth, were fractured, mostly in two places, before and behind; on the right side the second rib was broken. The right bronchus was severed and the pedicle of the lung nearly divided; the lungs themselves were uninjured. The right pleural cavity was occupied by blood. The heart was completely detached, lying quite free therein at the lower part of the cavity. The pericardium had been ruptured on the right side vertically, and through this aperture the heart had evidently escaped. There was a fracture of the spine at the level of the third dorsal vertebra, as though produced by over-extension; rupture of the upper end of the descending aorta and rupture also of the œsophagus. There was a longitudinal fissured fracture of the posterior fossa of the skull, and slight capillary extravasation over the brain. Amongst other things, two features of special interest about this case were the absence of marks of external violence over the region of the thorax externally, and the condition and position of the heart, which was completely isolated from all its attachments, lying quite free in a pool of blood at the base of the right pleural cavity.

"A SEQUEL TO SECRET REMEDIES."

WE have received from Mr. Frederick Phillips a pamphlet with this title, which has been written in reply to the statements and inferences of "Secret Remedies" published last year by the British Medical Association.

BONE-SETTING.

WE received from Mr. H. A. Barker a letter on Nov. 23rd in reply to our article in THE LANCET under this heading. Mr. Barker says:—

> "You throw out a hint of doubt as to the authenticity of the facts given in Mr. Stead's article, and suspect that he has exaggerated the situation. It is an easy matter to verify the facts. You find it impossible to believe that I can have treated over 30,000 cases in under 20 years practice—*conjecturing* that I must take an "hour over each case," and stating that I said 5 to 20 manipulations were necessary for each patient. As a matter of fact, I wrote, in explaining my modus operandi for talipes valgus, that from five to twenty manipulations were sufficient to bring about a normal condition of things in the majority of cases *of this kind*. I did not say that such a number of visits was necessary for every case. As a matter of fact hundreds of my patients are finished with in 1 or 2 visits. I have frequently dealt with 4 and even 5 patients in an hour as my books will show. I have often had 35 and 40 patients through my hands in a single day, and on rare occasions 40 and 45. Taking only 5 patients a day, you will arrive at about the figures I have given you—without sunday—on which day I sometimes see a dozen or more cases."

We are happy to insert Mr. Barker's statement. Our impression was derived from Mr. Stead's article.

REMEDIA "HOECHST."

THE attention of our readers may with advantage be drawn to an excellent compilation by Messrs. Meister, Lucius, and Brüning, Hoechst-on-Maine and 51, St. Mary Axe, London, of the new remedies which chemical, pharmacological, and biological researches have placed at the disposal of medical science during recent years. The work is in German and deals very comprehensively with pharmaceutical products and serotherapeutic and bacterial preparations. In addition to a description of each preparation, chemical reports by well-recognised authorities are appended. Remedia "Hoechst" is a book of 794 pages, and should be a valuable work of reference to the practitioner who can read German. We understand that copies are supplied to the profession free of charge.

F. S.—In the present state of the law we fear nothing can be done to stop the appalling harm done by the advertising quack.

ERRATUM.—In Mr. Robert Jones's paper on Fractures in the Neighbourhood of Joints, which was published in THE LANCET of Nov. 19th, it is stated more than once that fracture of the neck of the femur is treated by Mr. Jones "in an adducted position." This should be "in an *ab*ducted position."

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

A DIARY OF CONGRESSES.

THE following Congresses, Conferences, and Exhibitions are announced for 1910:—

„ 19th–22nd (Rome).—Twentieth Congress of Internal Medicine.

In 1911:—

Feb. 20th–25th (Cairo).—Fifth International Congress for the Blind.
March 2nd–6th (Berlin).—Thirty-second Balneological Congress.
„ 23rd (Paris).—First Congress of French Medical Journalists.
April 4th–7th (London).—Fourth Annual Nursing and Midwifery Conference and Exhibition.
„ 18th–20th (Paris).—Third Congress of Physiotherapy of French-speaking Physicians.

April 19th–22nd (Wiesbaden).—Twenty-eighth German Congress of Internal Medicine.
May–October (Dresden).—International Hygiene Exhibition.
May–October (London, Crystal Palace).—Festival of Empire Imperial Exhibition. (Profits to King Edward VII. Hospital Fund.)
May–October(?) (London, Shepherd's Bush).—Coronation Exhibition.
June (Paris).—First Congress of the International Medical Association for the Prevention of War.
June 5th–8th (Kolberg, Prussia).—Fifth International Congress of Thalassotherapy.
June and July (Romford).—Town Planning and Modern House and Cottage Exhibition.
July (Birmingham).—British Medical Association.
July 24th–29th (Belfast).—Congress of the Royal Sanitary Institute.
August or September (Berlin).—Third International Laryngo-Rhinological Congress.
September (Brussels).—Exhibition of Fractures.
" (Turin).—International Congress of Pathology.
Sept. 11th–15th (Berlin).—National Congress for the Study and Prevention of Infantile Mortality (*Goultes de Lait*).
" 11th–16th (The Hague).—Thirteenth International Congress on Alcoholism.
" 18th–23rd (Sydney).—Australasian Medical Congress.
" 24th–30th (Rome).—International Congress on Tuberculosis.
" 25th–29th (Rome) Seventh International Congress of Dermatology and Syphilology.
October (Cologne).—International Congress of Criminal Anthropology.
Oct. 1st–4th (Liége).—Second Congress of Alimentation.
Dec. 4th–9th (Havana, Cuba).—American Public Health Association.
(Date not fixed) (Genoa).—International Exhibition of Marine Hygiene.

In 1912:—
July (?) (Cologne).—International Congress of Nurses.
September (Prague).—International Congress of Radiology and Medical Electrology.
September (Berlin).—Sixth International Congress of Obstetrics and Gynæcology.
" Visit of German Medical Men to America.
Nov. 22nd–29th (Washington, D.C.).—Fifteenth International Congress of Hygiene and Demography.

In 1913:—
(London).—Seventeenth International Congress of Medicine.
(Dresden (?)).—International Conference on Cancer.

In 1915:—
(London).—International Prison Congress.
(London).—Imperial Exhibition (?)

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 15, Cavendish-square, W. (temporary address during building of new house).

TUESDAY.

SURGICAL SECTION (Hon. Secretaries—Jonathan Hutchinson, L. A. Dunn): at 5.30 P.M.

Papers:

Mr. W. G. Spencer: Septicæmia Hæmorrhagica; Severe Capillary and Parenchymatous Hæmorrhage of Septic Origin.

Mr. J. Hutchinson: Gastric and Intestinal Hæmorrhages (probably of Septic Origin) following Abdominal Operations.

Mr. A. E. Johnson: Fractures of the Patella without Separation of the Fragments.

WEDNESDAY.

SECTION OF BALNEOLOGY AND CLIMATOLOGY (Hon. Secretary—F. A. de T. Mouillot): at 5.30 P.M.

Paper:

Dr. Neville Wood: English Health Resorts for Foreign Invalids.

THURSDAY.

DERMATOLOGICAL SECTION (Hon. Secretaries—H. G. Adamson, J. H. Sequeira), at 11, Chandos-street, W.: at 5 P.M.

Cases.

NEUROLOGICAL SECTION (Hon. Secretaries—E. Farquhar Buzzard, Wilfred Harris), at 11, Chandos-street, W.: at 8 P.M.

Clinical Meeting.

FRIDAY.

ELECTRO-THERAPEUTICAL SECTION (Hon. Secretaries—Reginald Morton, G. Harrison Orton): at 8.30 P.M.

Paper:

Dr. Horace Manders: The Use and Value of Electricity in the Treatment of some Abdominal Diseases.

Cases:

Dr. Lewis Jones: (1) Case of Gonorrhœal Arthritis of Wrist: (2) Case of Sprengel's Deformity; (3) Early Dupuytren's Contraction.

Unusual Cases, Skiagrams, &c., will also be shown by Dr. Ironside Bruce, Dr. Reginald Morton, Dr. A. D. Reid, and Mr. Gilbert Scott.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY.—8.30 P.M., Dr. D. Ferrier: Acromegaly.—Prof. A. Keith: Acromegaly from an Anatomist's Point of View.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, 17, Bloomsbury-square, W.C.

TUESDAY.—8 P.M., Mr. C. A. Hill: Note on the Crystallisation of Sodium Salicylate Solution (with demonstration).—Mr. J. C. Umney: A Triangular Contest in Peppermint Oils. Additions to the Museum:—Mr. E. M. Holmes: (1) Note on the Sleeping Sickness Fly and Tsetse Fly (with lantern Illustrations); (2) Note on Truxillo Coca,

UNITED SERVICES MEDICAL SOCIETY, Royal Army Medical College, Grosvenor-road, S.W.

WEDNESDAY.—5 P.M., Lieut.-Colonel M. W. Russell, R.A.M.C.: Divisional Collecting Stations for Wounded.—Major W. E. Miles, R.A.M.C.(T.): Pruritus Ani.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

FRIDAY.—8.30 P.M., Adjourned Discussion on Sir Rubert Boyce's paper on Yellow Fever in West Africa. The following papers will also be brought up for Discussion:—Dr. S. T. Darling: Autochthonous Oriental Sore in Panama.—Dr. R. F. Jones: Tropical Diseases in British New Guinea.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.

MONDAY.—4 P.M., Dr. J. M. H. MacLeod: Clinique (Skin). 5.15 P.M., Lecture:—Dr. W. Ewart: The Therapeutics of Bleeding.

TUESDAY.—4 P.M., Dr. G. A. Sutherland: Clinique (Medical). 5.15 P.M., Lecture:—Dr. J. Collier: Some Forms of Peripheral Neuritis.

WEDNESDAY.—4 P.M., Mr. G. E. Waugh: Clinique (Surgical). 5.15 P.M., Lecture:—Dr. W. S. A. Griffith: The Use of the Douche.

THURSDAY.—4 P.M., Mr. H. J. Paterson: Clinique (Surgical). 5.15 P.M., Lecture:—Dr. J. Blumfeld: Anæsthetics in Cases of Cardiac and Pulmonary Diseases.

FRIDAY.—4 P.M., Dr. StClair Thomson: Clinique (Ear. Nose, and Throat).

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—10 A.M., Surgical Registrar: Demonstration of Cases in Wards. 12 noon: Pathological Demonstration:—Dr. Bernstein. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. 2.30 P.M., Mr. Dunn: Diseases of the Eye. 5 P.M., Lecture:—Mr. Armour: Intestinal Obstruction.

TUESDAY.—10 A.M., Dr. Robinson: Gynæcological Operations. 11.30 A.M.: Mr. Etherington-Smith: Demonstration of Minor Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Mr. Armour: Intestinal Obstruction.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. 12.15 P.M., Lecture: Dr. G. Stewart: Practical Medicine. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Mr. B. Harman: Diseases of the Eye. 2.30 P.M., Dr. Robinson: Diseases of Women. 5 P.M., Lecture:—Mr. Ll. Williams: The Etiology, Prophylactics, and Treatment of Dental Caries.

THURSDAY.—10 A.M., Surgical Registrar: Demonstration of Cases in Wards. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. 2.30 P.M., Mr. Dunn: Diseases of the Eye. 5 P.M., Lecture:—Mr. Baldwin: Practical Surgery.

FRIDAY.—10 A.M., Medical Registrar: Demonstration of Cases in Wards. Dr. Robinson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Medical Registrar: Examination of the Abdomen.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Diseases of the Eye. 2 P.M., Medical and Surgical Clinics. X Rays. Operations.

LONDON SCHOOL OF CLINICAL MEDICINE, Dreadnought Hospital, Greenwich.

MONDAY.—2 P.M., Operations. 2.15 P.M., Mr. Turner: Surgery. 3.15 P.M., Sir Dyce Duckworth: Medicine. 4 P.M., Mr. R. Lake: Ear and Throat. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat. 3.15 P.M., Special Lecture:—Sir Dyce Duckworth: Varieties of Albuminuria.

TUESDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Wells: Medicine. 3.15 P.M., Mr. R. Carling: Surgery. 4 P.M., Sir M. Morris: Diseases of the Skin. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin. 2.15 P.M., Dr. R. Wells: Differential Diagnosis of Early Forms of Insanity.

WEDNESDAY.—2 P.M., Operations. 2.15 P.M., Dr. F. Taylor: Medicine. 3.30 P.M., Mr. Cargill: Ophthalmology. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

THURSDAY.—2 P.M., Operations. 2.15 P.M., Dr. G. Rankin: Medicine. 3.15 P.M., Sir W. Bennett: Surgery. 4 P.M., Dr. Sale-Barker: Radiography. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat. 3.15 P.M., Special Lecture:—Sir William Bennett: Surgical Aspects of Abdominal Flatulence.

FRIDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Bradford: Medicine. 3.15 P.M., Mr. McGavin: Surgery. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

SATURDAY.—2 P.M., Operations. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10 A.M., Surgical Out-patient (Mr. E. Gillespie), 2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Nose, Throat, and Ear (Mr. H. W. Carson).

TUESDAY.—Clinic: 10 A.M., Medical Out-patient (Dr. A. G. Auld). 2.30 P.M., Operations (Mr. Carson). Clinics:—Surgical (Mr. Howell Evans); Gynæcological (Dr. A. E. Giles). 3.30 P.M., Medical In-patient: (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Skin (Dr. G. N. Meachen); Eye (Mr. R. P. Brooks). 3 P.M., X Rays (Dr. A. H. Pirie). 4.30 P.M., Lecture:—Mr. Brooks: Glaucoma.

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patient (Dr. A. J. Whiting); Surgical (Mr. Carson). 3 P.M., Medical In-patient (Dr. G. P. Chappell). 4.30 P.M., Demonstration:—Dr. Whipham: Selected Cases of Children's Disease.

FRIDAY.—2.30 P.M., Operations (Mr. Howell Evans). Clinics:—Medical Out-patient (Dr. A. G. Auld); Surgical (Mr. E. Gillespie); Eye (Mr. R. P. Brooks). 3 P.M., Medical In-patient (Dr. R. M. Leslie).

HOSPITAL FOR SICK CHILDREN (UNIVERSITY OF LONDON), Great Ormond-street, W.C.

THURSDAY.—4 P.M., Lecture:—Dr. Thompson: Tetany.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, S.W.

WEDNESDAY.—4 P.M., Lecture:—Dr. B. Shaw: Ultra Chronic Pulmonary Tuberculosis.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C.

TUESDAY.—3.30 P.M., Clinical Lecture:—Mr. D. Armour: Surgery of the Nervous System.

FRIDAY.—3.30 P.M., Clinical Lecture:—Dr. J. Collier: Aphasia.

CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn-road, W.C.

TUESDAY.—3.45 P.M., Lecture:—Mr. W. Stuart-Low: Accessory Sinuses.

FRIDAY.—3.45 P.M., Lecture:—Dr. A. Wylie: Larynx.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C.

THURSDAY.—6 P.M., Chesterfield Lecture:—Dr. M. Dockrell: Bullous and Vesicular Eruptions (continued)—V., Herpes; VI., Zoster; VII., Dermatitis Herpetiformis.

ANCOATS HOSPITAL, Manchester.

THURSDAY.—4.15 P.M., Dr. F. C. Moore: Uræmia. (Post-Graduate Clinic.)

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (12th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M.), St. Mark's (2.30 P.M.), Central London Throat and Ear (Minor 9 A.M., Major 2 P.M.).

TUESDAY (13th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M., Ophthalmic, 2 P.M.), Tottenham (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.), Royal National Orthopædic (9.30 A.M. and 4 P.M.).

WEDNESDAY (14th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

THURSDAY (15th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal National Orthopædic (9 A.M. and 3.30 P.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M.), Tottenham (Gynæcological, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

FRIDAY (16th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Royal National Orthopædic (3.30 P.M.), Soho-square (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2.30 P.M.), St. Peter's (2 P.M.), Central London Throat and Ear (Minor. 9 A.M., Major, 2 P.M.).

SATURDAY (17th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 A.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M.), West London (2.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic (2 P.M.) Hospitals operations are performed daily.

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(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Dec. 7th, 1910.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rain fall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Dec. 1	29·79	S.E.	0·69	47	46	39	43	44	Raining
,, 2	29·95	S.E.	0·46	46	44	43	42	43	Raining
,, 3	29·90	S.E.	0·21	45	45	40	41	41	Overcast
,, 4	29·47	S.W.	0·24	67	53	41	45	47	Cloudy
,, 5	29·20	S.W.	0·23	71	54	47	49	52	Cloudy
,, 6	29·28	E.	...	56	52	47	47	48	Overcast
,, 7	29·60	S.	0·01	57	52	45	48	48	Cloudy

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